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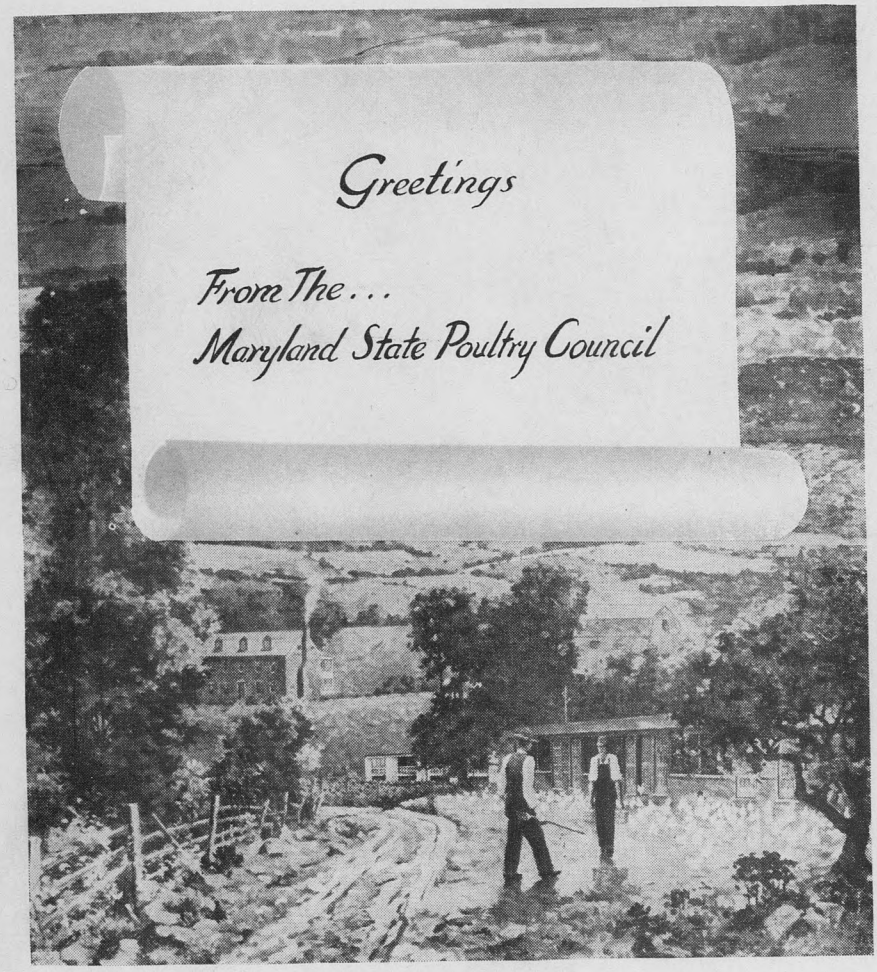
1944

# THE 1944 MARYLAND POULTRY YEARBOOK




When peace returns, the production of eggs and poultry meat will continue to be the second most important agriculture enterprise in Maryland.

The poultry industry provides Maryland farmers with over one-fifth of their total farm income.

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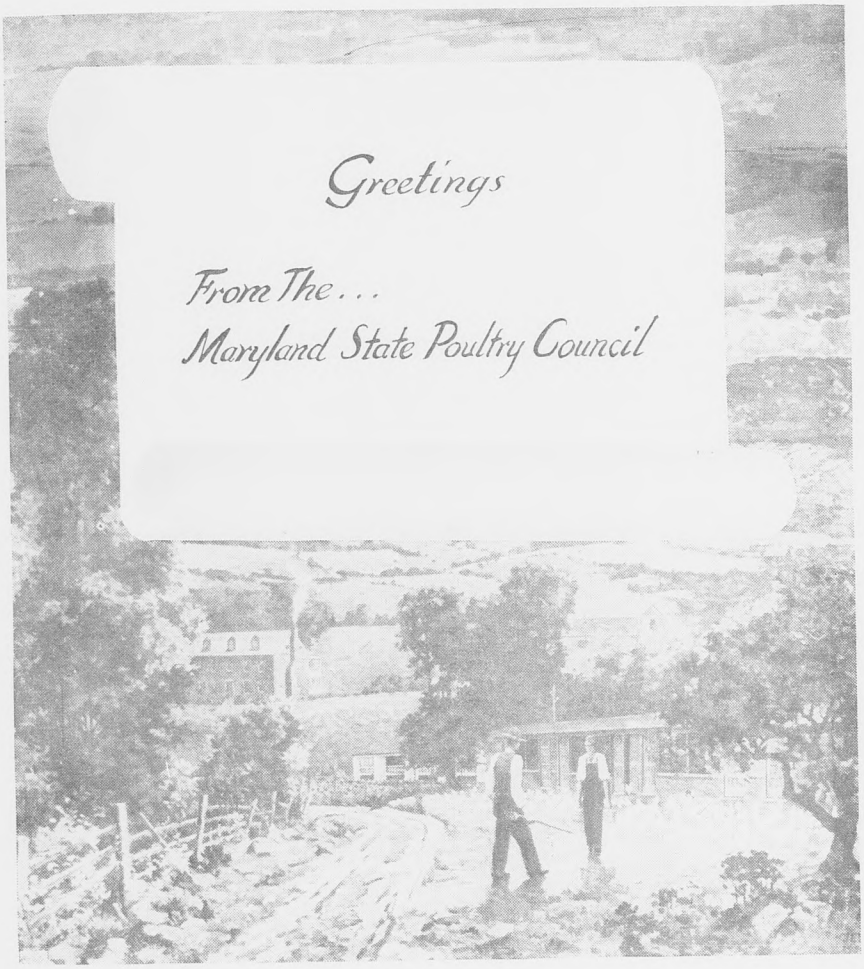
# THE 1944 MARYLAND POULTRY YEARBOOK




When peace returns, the production of eggs and poultry meat will continue to be the second most important agriculture enterprise in Maryland.

The poultry industry provides Maryland farmers with over one-fifth of their total farm income.

# HUBBARD'S NEW HAMPSHIRES

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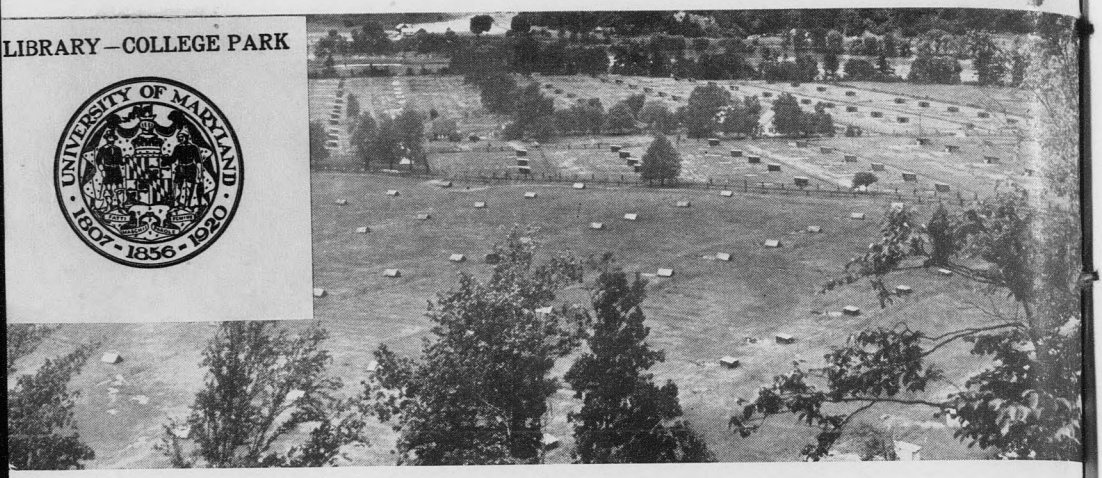

# ON THE GROWING RANGE

## Where Balanced Breeding Produces Chicks that Live - Grow Fast - Produce

Two generations of Hubbards have contributed their time and energy in building this profit-bred strain—Hubbard's New Hampshires. It has been accomplished through ceaseless trapnesting, pedigree breeding — through an 8-point balancer breeding program—through good management and careful selection year after year.

### BALANCED BREEDING IMPORTANT

Non-profitable characteristics have been bred out—money-making features bred in. At no time has there been an attempt to build one quality at the expense of another. As a result Hubbard chicks inherit generations of proved blood. They are strong, big-bodied, officially Pullorum passed. They live, grow fast, mature early, become excellent layers and have the stamina to keep on laying.

### BROILER PRODUCTION

For more broiler profits choose Hubbard's Cross Bred New Hampshire Rocks. Controlled breeding makes the big-bodied chicks live, feather early, grow rapidly, and develop into heavy-meated, solid broilers. Weekly hatches.

### FREE CATALOG

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# HUBBARD FARMS

**WALPOLE —— NEW HAMPSHIRE**

**& Lancaster Pennsylvania**

# THE 1944

# MARYLAND POULTRY

# YEARBOOK

Published by

THE MARYLAND STATE POULTRY COUNCIL

# OFFICERS

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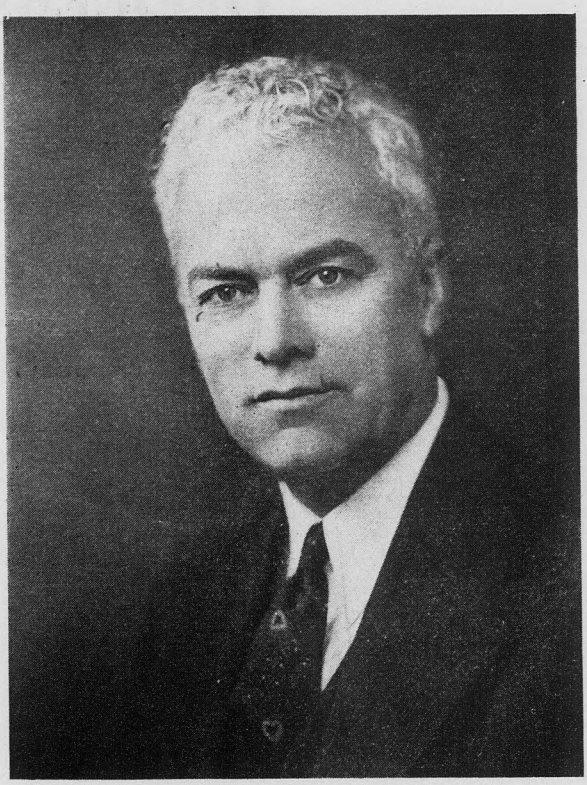
Maryland Farm Bureau Federation

# Greetings

**to the**
**Poultry People**
**of**
**Maryland**



**Dr. H. C. Byrd**

Poultry Producers are to be congratulated on their achievements in meeting the 1943 war production goals for eggs, broilers, and turkeys. Every branch of the industry did a remarkably fine job in spite of numerous difficulties.

Everyone appreciates the fact, of course, that as the war goes on, difficulties will increase and more adjustments may become necessary. Market egg production, broiler production, turkey production and the hatchery business are stable industries in Maryland and everything possible should be done by Federal authorities to protect the stability of these industries. It is hoped that during 1944 sufficient feed supplies will be made available to enable producers to carry on with the war-food program and it is also hoped that prices and marketing conditions will be maintained on a basis that will keep these industries on a healthy basis and provide reasonable profits to producers.

The University of Maryland is always anxious to help the industry and will extend help in every way possible.

H. C. Byrd

President, University of Maryland

# OFFICERS

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### 1943 Officers

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# TO THE POULTRY PRODUCERS OF MARYLAND

I am glad to again extend greetings and appreciation to the poultry producers of Maryland. You are doing a wonderful job in meeting war demands. The difficulties with which you are confronted, primarily in the protein feed field, make your task so much harder in the production of eggs, as well as poutry meat. I know also of the difficulties that are confronting our broiler producers and the great contribution that they are making to supply our poultry meat needs.

**Dr. T. B. Symons**

You are also confronted with an added problem in reducing loss from disease. I have just been in contact with the hazards that some of our turkey producers are experiencing by such losses. However, the progress that the poultry industry has made during the last five years is remarkable. The improvement in sanitary conditions and the increased efficiency in production mark the progress of the industry throughout the state.

We are proud of the accomplishments of our Poultry Department, likewise the cooperation that is given by your producers and hatcherymen in the development of the whole industry throughout the state.

May we hope that you will be able to continue to meet war demands and at the same time establish our industry on a broader basis to meet post-war conditions. I trust in the consideration of post-war plans by our State Committee, careful consideration will be given the place that the poultry industry should take in the prosperity of our producers in the years to come.

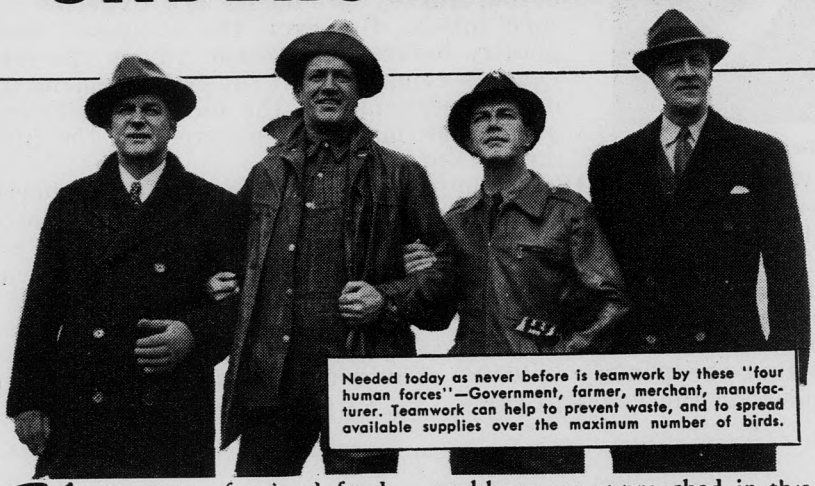
Sincerely yours,

T. B. SYMONS,
Dean of the College of Agriculture
and
Director of Extension Service

# We Have a Job to Do Together

*. . . a job for*

## TEAMWORK *and* UNDERSTANDING



Needed today as never before is teamwork by these "four human forces"—Government, farmer, merchant, manufacturer. Teamwork can help to prevent waste, and to spread available supplies over the maximum number of birds.

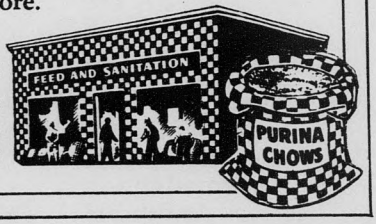
*The* amount of mixed feed that can be shipped this month into any poultry or broiler area, will depend entirely upon the quantities of raw materials which manufacturers are able to procure. Dealers and manufacturers, alike, are doing everything that is humanly possible to bring in every available ton.

Teamwork and understanding will help to make the most of the feed that is obtainable. If all problems are approached in this spirit, there will be a minimum of waste and a maximum number of birds fed.

The four men pictured above represent the four forces on today's production team—Government, farmer, merchant and manufacturer. They are all shooting for the same goal. True teamwork and understanding among all four will help to improve the final score.

PUBLISHED IN THE INTEREST OF INCREASED FOOD PRODUCTION *by*

**PURINA MILLS**



# TO THE POULTRYMEN OF MARYLAND

As State Supervisor of Agriculture in the public schools of Maryland, I greet you in the name of the F. F. A. Boys, the Future Farmers of America. Over 3,400 farm youth in the high schools of Maryland are pursuing more or less intensive studies in poultry depending upon the part of the State in which they live.

Dr. H. F. Cotterman

As Assistant Dean of the College of Agriculture of the University of Maryland, I greet you in terms of the many educational opportunities which such great University provides for the advancement of your sons and daughters.

For the duration of the war the facilities of these educational institutions with which I am associated will continue to deal with food production and pre-induction war training.

As soon as the war is over their energies will be directed toward the problem of rehabilitation. Their responsibility in this nation-wide movement will be heavy. A recent survey is authority for the estimate that ten million young men and women in the United States will return to the public high schools, colleges and universities for re-education. It is the conjecture that four million of these will return to the high schools and six million to the colleges and graduate schools.

Many of these young people will be youths approaching adulthood, many more will be young adults quite well on in life who were caught by the exigency of war at a critical stage in their development.

When this period of adjustment comes you may be assured that the public high schools of Maryland and the various departments of the University including those in the College of Agriculture will bend every effort to meet the needs of those who live in the State or return to it and seek re-education to meet th post war problems and opportunities of life here and elsewhere.

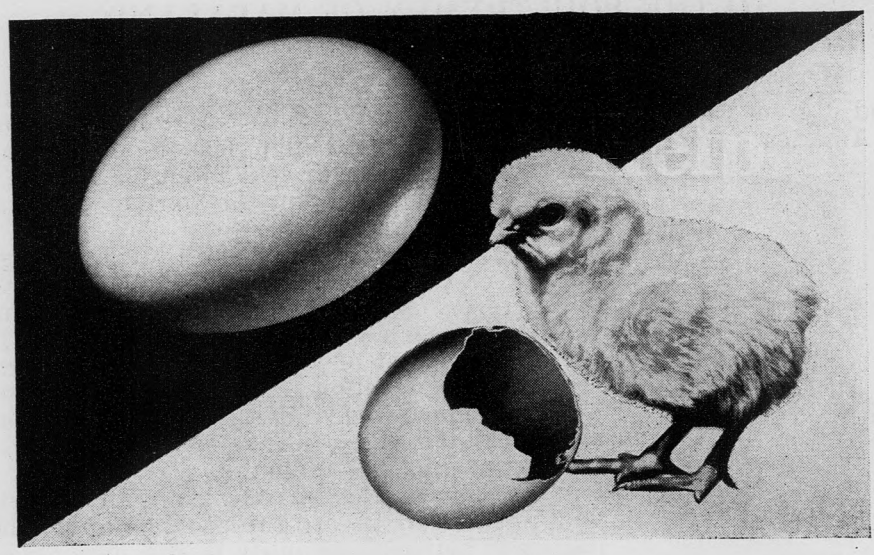
Sincerely yours,

H. F. COTTERMAN

Assistant Dean, College of Agriculture

and

State Supervisor of Agriculture in Public Schools



# The Shell Makes An Egg A SUCCESS OR FAILURE

You can't have a good egg without a good shell. And you can't have a good broiler without a good egg. A superior Calcium Carrier is vital for making the finest shells and for raising strong boned broilers.

## Supply That Calcium Carrier by Using

### 1. "Lime Crest" Calcite Crystals for Grit

"Lime Crest" Calcite Crystals perform all grinding functions of hard grit. In addition they dissolve slowly to provide the all-essential Calcium needed for good shell making.

### 2. Feeds enriched with "Lime Crest" Calcite Flour

"Lime Crest" Formula MIC-8009 should be used to fortify the ration with Calcium, Iodine and Manganese. An adequate mineral supply in essential for health and high egg production.

*We will be happy to send you free booklet—*
"Plenty of Calcium for Shell Making."

***"Back the Attack"—Buy War Bonds***

Lime Crest TRADE MARK BRAND

**LIMESTONE PRODUCTS CORPORATION OF AMERICA**
**Newton, New Jersey**

# GREETINGS TO MARYLAND POULTRY PRODUCERS

Maryland poultrymen deserve the heartfelt congratulations of all citizens for their splendid achievements during the war period in the face of great difficulties. They have stepped u pthe production of both eggs and meat to the limit of available feed supplies. In the light of the growing feed shortage, it is essential that those feeds which are available be used most efficiently. With this end in view, the Poultry Department of the Maryland Agricultural Experiment Station is bending every effort in its emergency research program to discover the most efficient ways in which plant proteins may be substituted for those of animal origin in the rations of both growing chickens and laying hens. At the same time, the Station has been running tests with protein feeds now on the market to insure that high quality in these feeds be maintained. Parallel with these studies others are in progress to permit the most effective use of the vitamin-bearing feed supplements for both chickens and poults. All of these lines of study are directed toward the most economical utilization of feed supplies to maintain the volume of poultry production at a high level. It is hoped that the results of the studies on nutrition and other experiments on breeding and management which are conducted under the stress of war emergency may bring to light information that will permit added economies in the industry after the present emergency has passed.

Dr. W. B. Kemp

With the continued close association between the Maryland Agricultural Experiment Station and the poultry industry of the State, it is a desire of all concerned that this institution may be of maximum service to that industry.

W. B. KEMP,

Acting Director, Maryland Experiment Station

DU PONT BETTER THINGS FOR BETTER LIVING . . . *Through Chemistry*

"DELSTEROL"

# A VITAL FEED INGREDIENT

for

## GROWTH, HEALTH, AND EGG PRODUCTION

TODAY'S feeding problems in the face of wartime demands for increased production of eggs and poultry meat make it more important than ever to be sure the feed you buy is properly and adequately fortified with Vitamin D.

Leading feed manufacturers have found "Delsterol"—Du Pont's trade-marked name for its "D"-Activated Animal Sterol—an ideal source of this vital ingredient.

"Delsterol" is supplied to feed manufacturers in dry, edible powder form to facilitate accurate, thorough dispersion in mixing. It is chick-tested to assure uniform efficiency. The fact that it is made entirely of domestic raw materials means it is always available.

Further, "Delsterol" is highly concentrated and exceptionally stable. It does not congeal in cold weather, nor impart "off" tastes or odors.

Developed through more than ten years' research, "Delsterol" has now been proved by years of feeding to some of America's finest flocks. For further information about "Delsterol," see your feed manufacturer or dealer, or write direct to E. I. du Pont de Nemours & Co. (Inc.), Organic Chemicals Department M.P. 1, Wilmington, Del.

**LOOK** for the words **"D"-ACTIVATED ANIMAL STEROL** (VITAMIN D) on poultry feed bags or tags

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**(VITAMIN D)**

***DELSTEROL**—Du Pont's registered trade mark for its "D"-Activated Animal Sterol

# REGULAR CULLING TO MAINTAIN A PROFITABLE LEVEL OF EGG PRODUCTION

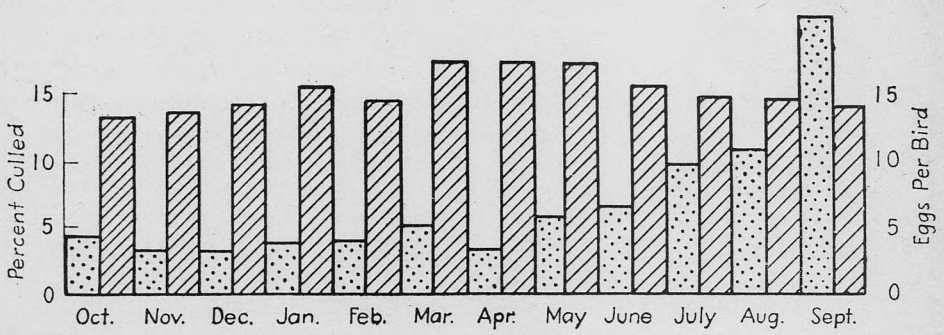
By MORLEY A. JULL, University of Maryland

It is always important for flock owners to keep in mind that the cost of feed amounts to about one-half of the total costs of producing eggs. At present feed prices, feed costs represent more than one-half of the total costs of production, which is one reason why every flock owner should be more interested than ever in the efficient management of the flock.

Regular flock culling is a very important management factor that goes a long way toward maintaining an efficient level of egg production in the flock. The minute that a pullet or yearling hen goes out of production she is a potential source of loss, because until she returns to laying she returns nothing for the feed consumed. Therefore, the sooner she is culled from the flock the better, especially if she gives every indication of not resuming laying for some time. Culling the flock regularly is very necessary to maintain an efficient level of production.

Among flocks comprised of hens and pullets entered in the Connecticut home egg-laying contest for 1939-40, about 50 per cent of the birds were culled, and there was about 10 per cent mortality, leaving about 40 per cent of the original number at the end of the year. Most of the culling was done during July and August, but a certain amount of culling from month to month was found to be absolutely necessary to maintain an efficient level of egg production. This is a problem of efficient flock management, watching the birds in the flock to remove the loafers in order to save feed and thus produce eggs more economically.

In the chart below is shown how regular culling from month to month helped very much to maintain a good level of egg production throughout the laying year among New Hampshires in the State of New Hampshires in 1938.




**The dotted columns show the percentage of the flock culled each month, while the cross-hatched columns show the average number of eggs produced per bird each month. These are actual records on more than 100,000 birds, mostly New Hampshires, entered in the N. H. home egg laying contest in 1938.** (Data of R. C. Bradley, N. H. Extension Service, 1939. Cut courtesy of Poultry Tribune.)

# STRIKE
## WHILE THE IRON IS HOT!

TODAY when consumer demands for eggs and poultry are "hot", it's the ideal time to do everything we can for our Industry.

It's the right time to emphasize to consumers the nourishment of these food items . . . to show how well they balance menus . . . to prove how important they are to the diet—in peacetime as well as wartime.

If we'll all do everything we can to promote the importance of eggs and poultry in the consumer mind, then we're preparing well for the post-war period.

A & P's thousands of stores and markets provide an active, year 'round, healthy "outlet." We invite you to drop into your nearest A & P and note the high-quality food, the great variety of food and the convenience we offer each customer.

A&P
ESTABLISHED 1859
FOOD STORES

**THE GREAT ATLANTIC & PACIFIC TEA COMPANY**
**National Egg & Poultry Department**
**Graybar Building, New York**

# GRAINS FOR POULTRY

By H. R. BIRD, University of Maryland

Because poultry feeds have customarily been made up largely of corn, wheat, wheat mill feeds, and oats and because the proportions of these grains have also been fixed by custom within rather narrow limits, many poultrymen have been greatly disturbed by recent shortages of corn and millfeeds. There is ample evidence that any one of these grains can be omitted from the diet of poultry or that poultry feeds can be made up largely of barley with very little grain from the "preferred list."

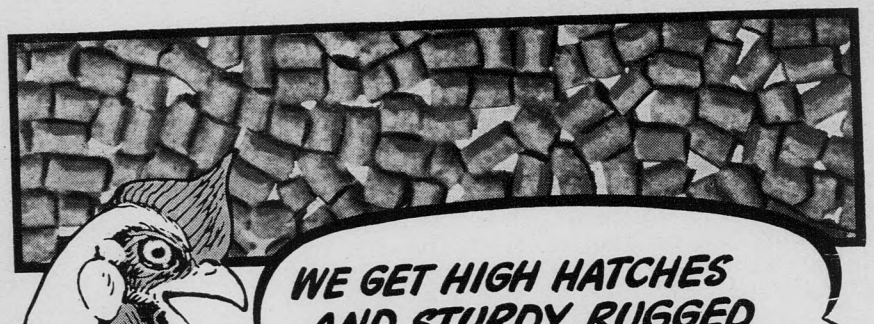
Several things should be kept in mind when it is necessary to make changes in the grain portion of the diet. First, yellow corn supplies vitamin A potency, and the other common grains do not; therefore, if all the yellow corn is removed from a feed, it may be desirable to use more alfalfa or more vitamin A oil unless birds are on good pasture. Second, whole corn and wheat are generally more palatable to poultry than are other whole grains; and whereas corn and wheat may be fed as scratch grain in the litter, other grains are likely to be wasted if fed in this manner and should be hopper-fed. Third, sudden changes in the grain constituents of the mash may or may not cause birds to "go off feed." (The likes and dislikes of poultry are as unpredictable as those of the poultryman. Sudden replacement of the corn or bran of a mash formula by barley, wheat, etc., sometimes seriously reduces feed consumption.) Fourth, rye and buckwheat are not sufficiently palatable to be fed as whole grain but may be ground and used to the extent of 10 or 15 per cent of the mash. Fifth, the number of deaths every year among poultry ascribed rightly or wrongly to the feeding of improperly cured grain in this region is sufficient reason for caution in the feeding of new-crop grains. If grain must be fed before enough time has passed to insure proper curing, it should be fed first in small quantities, preferably to a limited number of birds, and then in gradually increasing quantities, meanwhile observing the effect on the birds.

# NEED FOR BETTER CHICK SEXING

During the past hatching season there were numerous complaints on the part of chick buyers who bought sexed chicks that the sexing was in many cases quite inaccurate. Many buyers complained of high percentages of cockerels among pullet chicks purchased. Apparently there is much need for more thorough training of chick sexors.

# CONTROLLING MOIST LITTER IN LAYING HOUSES

Tests conducted recently on controlling moisture in the litter in laying houses showed that the litter was damper in houses that were not insulted than in houses that were insulated.



# WE GET HIGH HATCHES AND STURDY, RUGGED CHICKS – THANKS TO SUPER GREENS PELLETS

## *Concentrated Spring Range* in Ful-O-Pep Helps Reduce Hatching Losses*

**EGGS ARE VALUABLE** and feed is short . . . hatching losses must be cut to a minimum this year! Every egg that fails to hatch, every weak, poorly developed chick means a waste of vital feed, labor and equipment.

**PLAN NOW FOR BETTER HATCHES** and stronger, more livable chicks by feeding your breeders on Ful-O-Pep Super Greens Pellets as a supplement to the regular mash. Yes, Ful-O-Pep Super Greens Pellets are packed with Vitamin-rich sources such as Concentrated Spring Range, Nature's Richest Vitamin Combination, to help breeders produce big, husky chicks with deep yellow-colored shanks. These vitamin-rich pellets help you hatch a high percentage of hatching eggs and help your laying flock gain stamina and resistance to colds. They increase feed consumption and help maintain high egg production.

**TO FORTIFY BREEDER BIRDS** with a high vitamin intake, to get good hatching eggs, to produce sturdy, livable chicks, to help keep breeders healthy, supplement your regular feed with Ful-O-Pep Super Greens Pellets.

**REMEMBER,** hens take to these pellets readily, so you don't have to disturb your present feeding plan. All you do is sprinkle a few Ful-O-Pep Super Greens Pellets on top of your present mash according to directions. For details, write

**Reg. U. S. Pat. Off.*

**THE QUAKER OATS COMPANY, CHICAGO 4, ILL.**

# SEX SEGREGATION OF TURKEY POULTS

By R. E. PHILLIPS, University of Maryland

It would seem that the large turkey producers are overlooking a good thing when they do not segregate their young poults according to sex so that the groups may be reared separately.

The results obtained, particularly by the broiler producers, have proved conclusively that the sex segregation of day-old chicks, so that they may be grown separately, has resulted in many beneficial effects. The principal advantage is the birds grow more uniformly and fewer stunted birds are produced. Rate of growth of both sexes is favorably improved and the incidences of such chick vices as cannibalism and picking are minimized. Additional benefits which have been obtained when this method of management has been employed are a reduction in the time required for the onset of sexual maturity and less mortality.

The vent method of determining the sex of day-old poults is quite similar to that used for baby chicks. The vent is everted slightly by applying a small amount of pressure to each side of the abdomen. Differences in the appearance of small papillae on the lower, internal edge of the vent are used for the sex determination. Two rather small but prominent papillae are present in the male poult. These processes are found on each side of the midline of the vent. In the female poult the two processes are absent or greatly reduced in size and the folds of tissue which extend laterally from the midline are not as prominent.

Unlike baby chicks, turkey poults do not have to be sexed when they are day old. Sex can be determined at one to two weeks of age with a higher degree of accuracy than when the poults are examined just after they have been removed from the incubator.

Since the weight differences between male and female turkeys are quite marked even at 12 weeks of age it is reasonable to assume that the pullets would develop better if they were segregated from the males before this time. The small amount of work involved to separate the sexes at an early age would be more than compensated for by the improvement in the quality of both the breeding and market birds.

# SULFANILAMIDE MAY LOWER CHICKEN AND TURKEY EGG PRODUCTION

According to results secured by Drs. Hinshaw and McNeil of the California Experiment Station, sulfanilamide was found to be toxic to young poults. In the case of laying chickens and turkeys there was a drop in egg production and a tendency toward the premature laying of soft-shelled eggs.

This is the home of the Arcady Farms Milling Co. It has every needed modern facility for the manufacture of QUALITY feeds that will, in turn, make more fast friends among dealers and users of "America's Most Complete Feed Line." Now operating day and night to aid America's war effort.

THIS IS YOUR FEED BUYING GUIDE

COOPERATING 100% WITH THE PROTEIN CONSERVATION PROGRAM AGREED UPON BY THE U. S. DEPT. OF AGRICULTURE AND THE FEED INDUSTRY COUNCIL.

**FEED ARCADY FEEDS FOR ALL LIVESTOCK AND POULTRY**

# THE WARTIME FLOCK OWNER

By GEO. D. QUIGLEY, University of Maryland

The management of the wartime laying flock is a difficult job whether for the production of table eggs, or for hatching eggs for flock replacement. The owner of either type of flock is confronted with various problems, each of which, serious though it may be, may be partially offset by measures, which when planned in advance, are reasonably effective.

Principal difficulties are in shortages of feedstuffs, labor, and in equipment such as feeders and waterers. Let us examine some of these categories to see what can be accomplished.

The overall shortage of feed has been felt by the poultryman as dealer rationing by the major feed mixers, and the dealers have in turn, tended to supply their established customers. This fact has made it quite difficult for beginners to enter the poultry business, and in fact, beginners should ascertain that they have a supply of feed assured before investing in poultry production. Under the present circumstances it is quite obvious that the continued maintenance of established dealer contacts is a wise policy upon the part of every poultryman and farmer.

The poultryman is also confronted with the same problem as the large feed manufacturers—the problem of making adequate substitutions for scarce ingredients. The 1943 crop of corn will not be sufficient for all livestock, hence the poultryman must substitute other grains, especially wheat, barley and oats, for the corn which has been heavily used in the past. It should be remembered in making these substitutions that poultry are efficient users of all good quality grains, and excellent results in growth, egg production and fattening may be obtained with any reasonable combination of the available grains.

It is ordinarily observed in feeding layers that wheat and corn are the most palatable. Chickens take readily to good quality, heavy oats and barley. In the spring and summer of 1943 it was quite amazing in certain flocks how readily both young range birds as well as layers, formerly fed a corn-wheat scratch, took to heavy whole oats and barley. There is apt to be more difficulty experienced in persuading chickens to eat light, chaffy grains, however.

At the Maryland Agricultural Experiment Station, it was found that crushing of barley did not improve its palatability when fed to layers. The loss of Vitamin A from yellow corn in low corn diets can be overcome by increased use of Vitamin A bearing oils, also fresh or dried green leafy materials.

Poultrymen can also help the overall feed shortage by culling the loafers from their flocks more vigorously than ever, by not filling hoppers more than half full to prevent wastage, and by special attention to sanitation and disease control. He must make every effort to thus improve his efficiency for he not only has to compete in a general economic way, but he has to compete with other livestock feeders for supplies of feed stuffs under conditions which have been established as particularly favorable to other livestock producers, especially the hog producer.

# Christie's NEW HAMPSHIRES Burst Forth FULL OF SPIZZERINKTUM

## QUALITY MAINTAINED

### CHRISTIE STANDARDS UPHELD

In times like these when demand outruns supply, the temptation to lower quality is great, yet Christie standards are upheld. Andrew Christie is an idealist. He never sacrifices quality for quantity. Those who look to him for foundation stock are building soundly for the future.

After developing his famous strain of SPIZZERINKTUM New Hampshires, Andrew Christie turned his attention to Barred Rocks. The improvement accomplished is remarkable. Christie's Barred Rocks have the true SPIZZERINKTUM (surplus vitality).

### SPIZZERINKTUM Profit Factors

*** HIGHER FERTILITY AND HATCHABILITY**
*** HIGHER LIVABILITY OF CHICKS**
*** FASTER GROWTH — EARLIER MATURITY**
*** EARLY COMPLETE FEATHERING**
*** UNIFORM COLOR AND BODY TYPE**
*** QUICK MATURITY OF PULLETS**
*** LARGE EGGS OF HIGH INTERIOR QUALITY**
*** EXTREMELY LOW MORTALITY OF LAYERS**
*** SUPERIOR MARKET QUALITY OF DRESSED BIRDS**

**ALL BREADERS N.H. - U.S. PULLORUM CLEAN**

**Straight NEW HAMPSHIRES** **Straight BARRED ROCKS**

**CHRIS-CROSS ROCK - HAMP HYBRIDS, Barred**

Weekly Hatches the Year Around — But Plan Ahead

SEXING SERVICE Available on Straight Matings

Write for the Christie Price List and Full Details

# ANDREW CHRISTIE

**Box 33** **Kingston, N.H.**

Of considerable importance also is the qualitative shortage of feedstuffs. Various high vitamin and high protein feeds as alfalfa leaf meal, milk, milk substitutes, fish meal, high quality meat scrap, are almost non existent in the market. The feed industry and Experiment Stations have done a marvelous job partially overcoming these difficulties. It is recommended that producers who are in a position to do so feed locally produced skim milk (fed slightly sour) or buttermilk to their chickens, also to supplement feeds with good pasture or soiling crops. Blue grass, alfalfa, ladino or white clover, kale, swiss chard, in fact, any young green leafy material will do much to overcome certain qualitative shortages in our feeds. The same may also be said of milk in any available form. This program emphasizing fresh greens and milk becomes a "must" for the producer of hatching eggs.

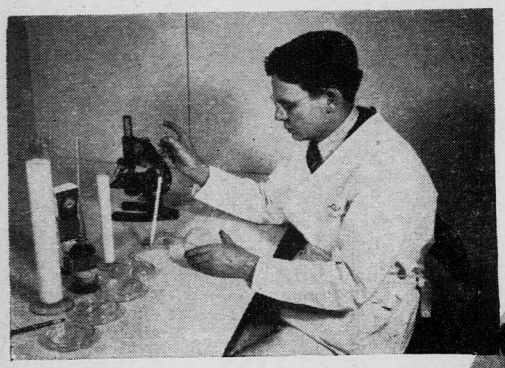
Labor shortage, or the fatigue resulting from demands upon the human body for greater and greater war effort, may be partially met by hopper feeding both grain and mash to layers. This program can be safely commenced when layers are first housed, or when they are in the flush of spring production. If it is possible to provide water under pressure, or still better—bubbling water founts, this will save hauling the 8 or 9 tons of water lugged by the poultryman caring for 100 layers in one year.

A labor saving practice worthy of more general use is the so-called "built-up" system of litter management. When employing this system the operator cleans his laying houses early in October, replacing old litter with 2 inches of straw, cane fibre litter, shavings, or other cheap and available litter. When this litter becomes soiled and broken up it is not removed but is covered with 1 inch of fresh litter material. This process continues so that by cold weather there are from 4 to 6 inches of total litter upon the floor. This deep bed of fine material acts as a floor insulator and prevents condensation of moisture upon the floor, resulting in more comfortable birds, and less labor expended in cleaning. The litter is usually not allowed to exceed 6 inches in depth, but the decision depends more upon interference with doors, hoppers, etc., than upon actual depth of litter. In March the entire mass is removed and makes a wonderful lot of fertilizer to put under spring crops. The labor saving and bird comfort advantages of this system contrast sharply with the plan of frequent cleaning in the winter months when new litter becomes wet in a few days.

The "built up" method of winter litter management would seem to raise possible sanitary questions, but these in practice appear to be completely balanced by the gains in labor saving, reduction in litter cost, and in dry litter during the difficult days of late winter.

Many of our Maryland poultrymen find themselves in a position, due to influx of war workers, to sell much of their produce at retail. Where time and facilities permit, these sales at full retail ceiling prices will be found most profitable. A roadside sign, and a fresh, clean well graded product will frequently result in a profitable business. Prospective relaxing of gasoline restrictions will tend to enhance this golden opportunity.

# Why You Can Depend Upon
## DR. SALSBURY'S PRODUCTS AND SERVICE



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**A Dr. Salsbury scientist investigating a new chemical's effect on germs. Disease causes are studied; new medicines sought constantly.**

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**To assure uniformity of action and dependable quality, exacting laboratory test procedures control the making of every Dr. Salsbury product.**

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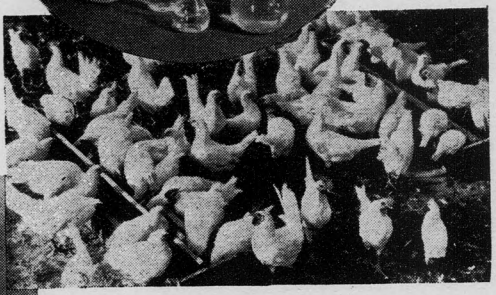
**On our 55-acre Poultry Research Farm, genuine Dr. Salsbury's products are tested in use under controlled actual farm conditions.**



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**Poultry health schools and clinics . . . special scientific bulletins . . . . . expert Dr. Salsbury service representatives help Dr. Salsbury dealers keep "out in front" in poultry health knowledge and their ability to serve.**

Follow the recommendations of the Poultry Conservation For Victory Program.

The name "Dr. Salsbury's" is your assurance of satisfaction. Say "Dr. Salsbury's" and be sure!

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WE ARE CO-OPERATING
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# DR. SALBURY'S LABORATORIES
CHARLES CITY, IOWA

A NATION - WIDE POULTRY HEALTH SERVICE

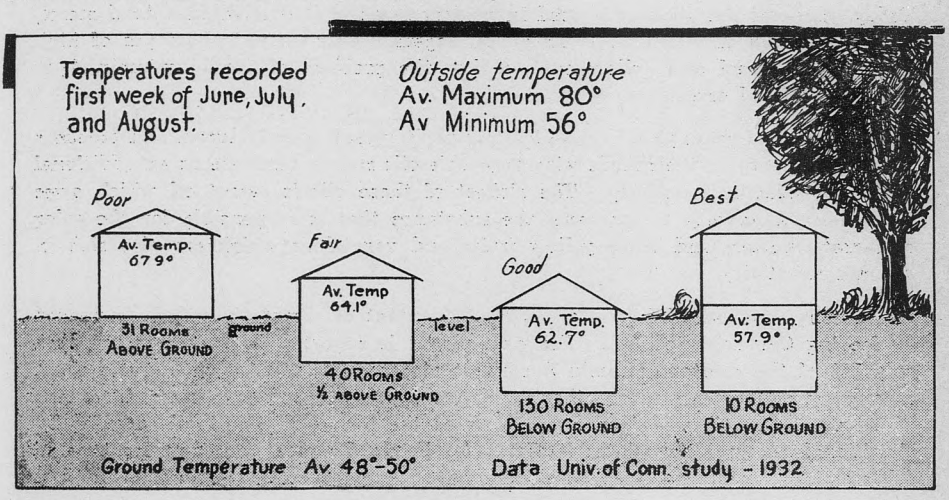
# UNDERGROUND EGG HOLDING ROOMS ARE BEST

By WADE H. RICE, University of Maryland

Nearly all hens lay eggs which, at the time of laying, meet all the requirements of FRESH or AA and A Grades.

Preserving this original market quality as well as preserving the ability of hatching eggs to hatch, is a responsibility of the producer as long as the eggs are on his farm.

Conditions under which the eggs are held are of relatively much greater importance than the length of time they are held before being sold on the market or to the hatchery.




TEMPERATURE: Egg quality is affected to a marked degree by temperature. Tests at Cornell University, some years ago, revealed that market eggs sustained as much loss in interior quality when held at 98.6 degrees F. for 3 days, as when held at 60.8 degrees F. for 23 days or at 44.6 degrees F. for 65 days.

Fertile eggs start development of the embryo at 69 degrees F.

Eggs at temperatures below 50 degrees F. are likely to "sweat" when carried to a warm room. This sudden change in temperature also causes a partial breakdown of the delicate structure of the albumen and yolk. This break-down serves to lower the quality of market eggs and also impairs the hatchability of hatching eggs.

At temperatures above 60 degrees F. the structure of the white and yolk deteriorates rapidly after the eggs are held for a few days.

This establishes a temperature range of 50 to 60 degrees as the ideal level for holding either market or hatching eggs until they are consumed or incubated.

HUMIDITY: The rate of evaporation of moisture through the pores of the shells of eggs is dependent upon the humidity of the room where they are held and also the length of time they are held. This loss of moisture results in increased size of the air cells. The size of the air cell is one of the most important factors by which the freshness or quality of eggs is judged. Experiments have shown that a relative humidity (amount of vapor present in the air in relation to the maximum

# FACTS ABOUT CAROTENE

**In the past, yellow corn, alfalfa meal and green range have been the main sources of vitamin A in poultry feeds, supplied in the form of carotene. Fish liver oil added primarily as a source of vitamin D has added more or less to the supply, since fish oils usually also contain vitamin A.**

**Today, much of the vitamin D used in poultry feeds is D—activated animal sterol, which is devoid of vitamin A. This fact, together wth current shortages of high grade alfalfa meal and yellow corn, makes the problem of supply vitamin A to poultry a critical one.**

**For a number of years past, certain leading poultry feed manufacturers and breeders have been fortifying their feeds with vegetable oils rich in carotene as an additional source of vitamin A activity. The richest of these oils is carrot oil which owes its vitamin A activity to carotene, the substance that is responsible for the color of carrots, butter, and other yellow fruits and vegetables which are also rich in vitamin A activity.**

**Incidentally, the availability of the vitamin content of carrots is greatly increased by feeding the extracted oils. For example, it is reported in the literature that only 1% of the carotene vitamin A content of carrots is utilized by humans when carrots are eaten raw; on the other hand, 100% of the carotene vitamin A content of carrot oil is utilized, when fed in any of the forms of carrot oil supplied by Nutritional Research Associates — Carex for Feeds, Caradee, Quintrex Carotene in Oil, etc.**

**Another important fact in connection with the use of extracted carotene, such as carrot oil, is the greater stability of carotene as compared with the vitamin A supplied by fish liver oils, after mixing in the feed. For this reason, it is generally not necessary to incorporate as many units of carotene as a source of vitamin A, as is customary when fish liver oils are used as a source of this vitamin.**

**While the cost of carotene derived from carrots is higher than vitamin A from fish liver oils, on a per million unit basis, users of carrot oil products appear to be convinced that the extra cost is justified by the superior feeding results obtained.**

**Among the carrot oil products produced by Nutritional Research Associates, used in poultry feeds, are Carex for Feeds, Super Carex, GroVite, and Quintrex Carotene in Oil. 2000 D Fortifier is a source of chick tested vitamin D in dry form, which does not contain carotene. Caradee contains both carrot oil and chick tested vitamin D, and is made in two vitamin D potencies, 180 D and 400 D.**

**Full information and prices will be supplied on request. See also page 8, 1943 edition of Maryland Poultry Yearbook.**

## NUTRITIONAL RESEARCH ASSOCIATES, INC

**255 Broad Street** **South Whitley, Indiana**

amount possible) of about 75%, is effective in keeping evaporation of egg moisture to a minimum and at the same time hold the development of molds in the room to a minimum.

THE EGG ROOM: Effective control of both temperature and humidity in the egg room on the farm can be accomplished for all practical purposes without employing expensive equipment.

Where market or hatching eggs are sold at least once a week, adequate control of temperature and humidity can be accomplished through proper design and management of a well constructed egg room.

Taking advantage of the natural factors of soil temperatures and moisture, together with employing seasonal measures to modify them is within the reach of practically every poultryman.

As shown in the accompanying illustration, egg room temperatures in summer are most favorable in rooms located underground beneath another building. Trees and shrubs to shade the soil adjoining the cellar, especially on the south and west sides, is of special importance in Maryland due to the extreme heat of the direct sun in the summer months.

The shading results in much lower temperatures in both the cellar and surrounding soil during the summer months. Adding some heat in severe cold weather is easily accomplished by electric heater or by other means.

Windows for light or ventilation should preferably be located on the east or north sides. South and west windows should always be shaded against the summer sun to prevent high temperatures in the cellar.

An accurate thermometer should be kept in the room in order that steps may be taken to prevent extreme temperatures.

Addition of moisture by sprinkling certain floor areas, especially during dry spells, is helpful in maintaining adequate humidity in the room. Condensation of moisture on windows or other parts of the room is evidence of excessive humidity, which if allowed to persist will cause molds and musty odors, which may affect the flavor of the eggs held in the room.

Spraying the interior of the egg room with a 10% solution of zinc chloride is effective in destroying molds which may develop in the rooms. The effect of the zinc chloride will usually last for several months.

Masonry walls, and a concrete floor are best for the maintenance of adequate moisture and also facilitates easy cleaning of the room.

Old abandoned ice pits, underground dairy caverns and similar places offer good opportunities for construction of satisfactory egg rooms on many Maryland farms.

For new excavations, an eastern, or northeastern hillside slope is preferable to other exposures, since such locations are cooler in summer, especially when they are well shaded.

In view of wholesale price premiums ranging from 5 to 16 cents per dozen ($1.50 to $4.80 per case) for Grade A (FRESH) large eggs over ungraded and Grade C, as established by the Federal Government, it is evident such premiums could well mean a difference of $1.00 per bird per year in egg returns. In flocks of 400 or more birds this premium well justifies the extra care and provision of an egg room designed to insure the marketing of top quality market and hatching eggs.

# USE THE HILLTOP Disease Control PROGRAM

## Learn How

## Hilltop's Modern Scientific Methods Successfully Suppress Disease . . . .

Dr. B. F. Kaupp

**DR. B. F. KAUPP**

the well-known authority on Poultry Diseases, heads our laboratory staff of 18 assistants who are at the service of our customers and dealers at all times. If you are not sure what disease may be afflicting you flocks, send Dr. Kaupp some live birds for FREE Post-Mortem examination and diagnosis.

**OUR DISTRIBUTORS IN THE EAST**

The Eastern Grain Growers Co-operative Association and its numerous branches stock a full line of Hilltop Products.

**Ask You Local Branch**

about these well-known items in the Poultry Health field:
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MOR-EEN
WOR-MOR
VAPO-MOR
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BRO-NO-MOR
and other proven specifics.

**SANITATION IS IMPORTANT**

BUT—in spite of the utmost cleanliness, germs and contagion will get around, and it is well to be prepared for emergencies.

**718 Wash'n Ave. No.**

HILLTOP LABORATORIES
*Aids to Poultry Health*

**Minneapolis Minn.**

# SELECTING BREEDING COCKERELS

By CHARLES S. WILLIAMS, University of Maryland

Proper selection of cockerels is one of the most important tasks that faces every Maryland hatcheryman. The methods used in the selection of breeding cockerels and the efficiency with which the selection is made will influence the quality of chicks produced more than any other single selection the hatcheryman makes. The principal reason for this is that the male is 10 to 12 times as important as the female in a breeding flock since one male is usually mated to 10 to 12 females.

Males used in Maryland hatchery flocks should be especially selected for their breeding or pedigree, rate of growth, rapid feathering, fleshing, condition and vigor, size and type as well as color and the many other factors which are usually considered.

In the selection for breeding value it is logical to assume that the more you know about the breeding of a bird the more accurate selection you can make. For instance, in the case of males from U. S. Approved flocks you know nothing of the actual production of either of the parents of male birds. In the case of males from U. S. Certified flocks you do know the sire was an R.O.P. bird but you know nothing about the performance of the dam. While in the case of R.O.P. males you know the pedigree of both the sire and dam. Maryland hatcherymen could well afford to pay more attention to the selection of male birds on the basis of their breeding.

Selection for rate of growth, rapid feathering and fleshing should be practiced much more extensively by Maryland hatcherymen than is done at the present time. Many hatcherymen think that since they do not produce broiler chicks that there is no need to select for the factors mentioned above. It should be kept in mind, mowever, that all birds that live are eventually sold for meat and the above factors are necessary if top prices are to be received for market birds.

Selection of cockerels for rate of growth, rapid feathering and fleshing should be made at a relatively early age. The most practical time for hatcherymen to select for these characters is from 6 to 8 weeks of age. At this age cockerels should be fully feathered over all parts of the body, weigh from 1½ to 2 pounds depending on the age and be well fleshed over the breast and legs. Selection of cockerels at this age will do much to improve the market qualities of chicks produced. Cockerels selected at this age should be identified in some manner such as toe-punching or windbanding and about three times as many as will be needed should be selected.

During the regular fall selection cockerels should be selected for condition and vigor. Strong healthy vigorous cockerels of good size and reasonably good type should be selected for the hatchery supply flock. Weak, undersize, long-legged, poor type cockerels should never be used in a hatchery supply flock. Through proper selection, taking into consideration the characters discussed in this paper, Maryland hatcherymen can improve the quality of their chicks more than by any other means. This is a joint responsibility of the hatchery operator and the flock owner and one which they must both shoulder in order to contrive to improve Maryland poultry.

# Let's be PRACTICAL!

## . . . This is no time to Quibble

over the prospective merits of a particular brand of feed. Use the feed you are fortunate enough to obtain with good judgment. ● Give special attention to the care, housing, and sanitation problems. ● Produce as much as you can, but don't attempt foolish quotas at the sacrifice of healthy birds or quality eggs.

PRACTICAL FEEDS FOR D&G FOR PRACTICAL FEEDERS

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**Compliments of**

# HASTINGS HATCHERY

**PARSONSBURG, MD.**

# SOME PROBLEMS FACING THE BROILER GROWER

By I. M. MOULTHROP,D.M.V., State Livestock Sanitary Service Laboratory, Salisbury, Maryland

All business is apparently facing a crisis at the present and the broiler industry is no exception. It is up against rather low O.P.A. price ceilings, allowing a very low margin of profit, if any, working with a poorer quality product on every hand. Increased labor costs, less efficient feed, lower quality chicks, and marketing at a later age all combine to make broiler production less profitable.

Every day we in the diagnostic laboratories have samples brought to us from flocks showing deficiencies and more severe losses from infectious diseases than ever before.

There is an old saying that "disease is much worse during war." I heartily agree with the above statement. For example, pullorum disease that in normal times has caused the broiler grower only nominal losses is now inflicting very severe losses. It is not at all unusual to see flocks even of young age in which there has been a 30-40% mortality. This loss in many cases is due to a combination of both infectious disease and malnutrition.

A very common problem brought to us is that in which the chicks arrive in a very thrifty condition, but eat very little, if any, and within a few days begin to "dry up," as the grower expresses it. These chicks gradually waste away. Many times this is overcome by using the time-consuming and laborious system of wet-mash feedings by using milk by-products to dampen the mash.

Another problem especially in the past summer has been vitamin A deficiency. This occured often at a rather early age, leading the observer to suspect a low supply in the chick body at hatching time. This has been overcome in several instances by the hatcheryman recommending to the grower that a small amount of feeding oil be added to the ration from the beginning until the chickens are several weeks old.

During the past summer we have also noted a very high mortality among chicks that have been shipped a long distance. Many of these chicks have been on the road over fifty hours. This means, especially in hot weather, that the chicks will overeat and drink in excess, which is followed by a diarrhea that is often confused with pullorum disease.

The problem of parasites, such as round worms and the like, have greatly increased during the summer months, probably due to the fact that chickens have been brooded in the same houses and lots for a long time, thus concentrating the number of worm eggs.

The last and probably the most destructive agent to be mentioned is coccidiosis. Many times the individual grower is not seriously affected by the mortality from this disease but the industry as a whole pays a very high price in both deaths and loss of weight. The usual methods of handling this disease are now not available, due to the usual shortage, however a few new drugs are being manufactured that show promise in controlling this disease. I hope to have more complete information on these drugs in the near future, since it may change our present method of control considerably.

# Two Wartime Helpers For Busy Poultrymen

*For Chicks:*

**Baltimore Stickless Luxury Liner Chick Boxes**

*For Eggs:*

# SAFE-TEE-KASE

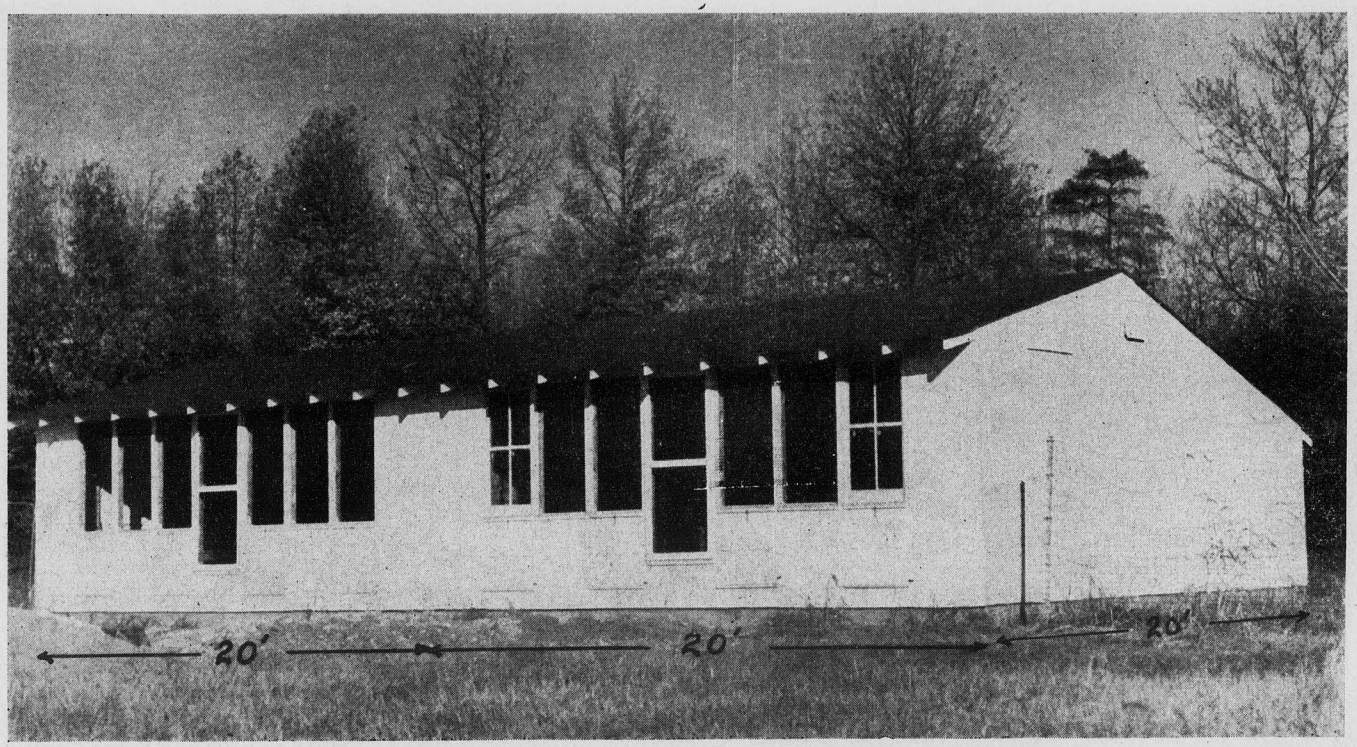
***the egg case that can "take it!"***

**These fine corrugated shipping containers made exclusively by**

## The Baltimore Paper Box Co.

**Makers of "GREEN BAND" regular Chick boxes**

**1301 Covington Street** **Baltimore 30, Md.**




The Maryland 20' x 40' Straw-Loft Laying House, with solid partition between pens, each pen being 20 x 20. The Straw Loft keeps the house warm in winter and cool in summer. The house is suitable for all parts of Maryland.

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### GERMOZONE

A liquid which **mixes** quickly and easily in the drinking water. Offers valuable protection against many of the **common bowel troubles** and **simple diarrheas.** Helps prevent spread of many disease germs. Acts in drinking water, 2nd, in crop, 3rd, back in intestines. For birds of all ages. Used in any kind of fountain.

### LEEMULSION

Used in drinking water for **colds** and **breathing troubles.** Acts inside, like a good cough medicine for people.

### VAPO-SPRAY

Spray treatment for symptoms of colds, wheezing, bronchitis. Rapid in action, high in antiseptic value. Economical.

### LICE KILLER

**A carbolineum,** excellent for mites and blue bugs. Spray in houses or paint liberally on roosts and dropping boards.

# LEE REMEDIES

## *Help You Protect the Health of Your Flock*

Your birds deserve the best of care these days in order to meet vital wartime egg and poultry meat quotas. To assist you in maintaining good poultry health, the Geo. H. Lee Company offers a full line of quality poultry medicines. These products are the result of 49 years of study, experimental work and service to the poultry industry. Ask for Lee Remedies at any Lee Dealer (drug, hatchery, feed or seed store).

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***"49 Years of Service to Poultrymen"***

### ACIDOX

**For care of birds with Coccidiosis.** A liquid, easily used in the drinking water and in any kind of container. An acid preparation which does not throw birds off feed.

### GIZZARD CAPSULES

Only wormer with patented **insoluble** coating. Won't sicken birds or check egg production. For all 3 kinds of worms—Large Round, Large Tape and Pin Worms.

### TONAX

**Tonic conditioner** for chickens and turkeys. Helps to build up strength in run-down flocks, especially following disease. For growing birds and layers. Convenient. Used in mash.

### PERCH PAINT

**Highly efficient nicotine lice control.** Also effective against feather mites.

## EXCESSIVE AMOUNTS OF LINSEDD MEAL HARMFUL

At the Ontario Agricultural College it was found that when as little as 4.5 per cent of linseed oil meal is included in the diet of growing chickens to replace its protein equivalent, rate of growth was retarded. Higher levels resulted in increased mortality and the health of the remaining birds was impaired. Linseed meal cannot be used to replace meat meal.

## DAILY AMOUNT OF FEED FOR LAYERS

The Cornell Experiment Station has prepared the following table showing the approximate daily amounts of feed for laying stock according to average bird size and level of egg production.

| Per cent production | Leghorns averaging 4 pounds each | General purpose breeds averaging 5½ pounds each |
|---|---|---|
| 30 | 22 | 25 |
| 40 | 23 | 26 |
| 50 | 24 | 27 |
| 60 | 25 | 28 |
| 70 | 26 | 29 |
| 80 | 27 | 30 |

## PROGENY TESTING TELLS THE TALE

The average egg production of the daughters of a sire or of a dam determines in a large measure the sire's and dam's relative breeding worth. A Register of Merit sire is a male 30 per cent of whose daughters entered in R.O.P. qualified for R.O.P. certification the previous year providing a minimum of 20 daughters qualified. For 1939-40 and 1940-41 the hen-housed average egg production of 39,975 daughters of ROM sires was 198 eggs. A Register of Merit dam is a female 30 per cent of whose daughters entered in R.O.P. qualified for R.O.P. certification the previous year providing a minimum of 4 daughters qualified. For 1939-40 and 1940-41 the hen-housed average egg production of 30,569 daughters of ROM dams was 207 eggs. Since ROM sires and dams are progeny-tested breeders, these records show what progeny-testing can accomplish.

**A. D. JORDAN, Inc.**
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From the beginning, 30 years ago, the specialists at Vineland Poultry Laboratories have worked tirelessly to reduce death losses in poultry flocks. Their program has emphasized prevention rather than cure.

Vaccination against Tracheitis and Fowl Pox is an essential part of any sound program to reduce mortality. Successfully vaccinated birds are not carriers and are immune for life against these diseases.

Vineland Vaccines are grown inside of eggs, under the supervision of the men who originally developed these vaccines. Prepared in this way, Vinland Vaccines are potent, purer and safer.

Because of their demonstrated purity and potency, Vineland Vaccines are used regularly by

**55% of all the R.O.P. Breeders of America**
**50 of the official Egg-Laying Contests of the United States**
**117 State and Federal Institutions**

VINELAND PIGEON NOX VACCINE is used to immunize pigeons against Pigeon Pox. VINELAND PIGEON NOX VACCINE is used by the U.S. Army Signal Corps, and the Royal Canadian Air Force Pigeon Section to protect messenger pigeons against Pigeon Pox.

VINELAND PIGEON POX VACCINE is recommended for the prevention of Fowl Pox in broilers, and in preventing the further spread of outbreaks of Fowl Pox in laying flocks. VINELAND PIGEON POX VACCINE is mild and does not interrupt egg production or growth.

**Pullorum, Too, Can be Completely Eradicated**

Pullorum (B.W.D.), responsible for untold loss of chicks, and reduced egg production, can be completely eradicated through persistent blood-testing plus surgical cleanliness in the hatching and incubator room. The rapid, Whole Blood Method of testing with Stained Antigen has proven its dependability.

**VINELAND STAINED ANTIGEN**

A precision-made product, tested for accuracy by two independent laboratories, then re-tested in our own laboratory.

**Look for Trade-Mark—Read Labels Carefully**

Our winged cross trade-mark, shown below, appears on all labels and wrappers. Read carefully dosages on the labels. The dosages which we prescribe are almost double those prescribed by others. Poultry disease workers agree that, IN ORDER TO ESTABLISH PERMANENT IMMUNITY, the dosages which we prescribe must be followed.

**FREE.** Our famous handbook, "Science Safeguards Your Flock Against Disease". Write for your copy.

**Our Vaccines are produced under U. S. Veterinary License No. 196 issued by U. S. Dept. of Agriculture**

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**Dr. Arthur D. Goldhaft, V.M.D., Director**

**BOX 70-MS** **VINELAND, N.J.**

**LOOK FOR THIS NAME** **AND THIS TRADEMARK**

**VINELAND VACCINES**

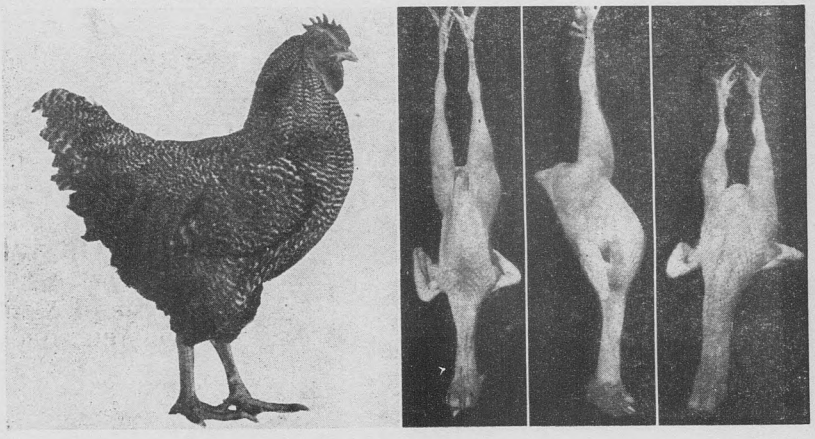
# IMPROVING THE TYPE AND FLESHING OF MARKET POULTRY

The great need for improvement in market poultry is clearly apparent in the dressed broilers, fryers, or roasters displayed on a farmers' market, in a butchers' shop, or in a store where dressed poultry is sold. For any one class of poultry, such as broilers, fryers, roasters, or fowl, there is such great variety in carcass conformation and fleshing condition as to convince anyone that very little has ever been done to breed strains of chickens that are uniform in body shape and fleshing ability.

Greater uniformity of body type and better fleshing ability could probably be attained in almost any flock by a more rigid selection of males and females used for breeding.

Whenever any birds in the flock are to be marketed, all of the birds in the flock should be examined carefully for fleshing, especially over the breast and legs. These parts constitute about 40 per cent of the live weight and about 45 per cent of the dressed weight of three-pound fryers. Dressed birds with plump, well-fleshed breasts are preferred by consumers. The degree of fleshing is influenced, of course, by diet and management during the growing season but fleshing ability is inherited so that birds fed the same diet and managed the same always differ a great deal in the degree of fleshing attained at marketing time. Since fleshing ability is inherited, it is important for the flock owner to keep for breeding purposes the best fleshed birds.

Body type is important because it affects the appearance of the dressed bird. At marketing time live birds to be kept as breeders should have relatively short shangs but good body weight, which is influenced by the width over the back, the anterior depth of the body, and length of the keel. Birds with very narrow and excessively deep bodies should not be kept for breeding. Fair anterior body depth and a fairly long keel tend to give the birds a well finished appearance when dressed for market, providing there is an abundance of fleshing over the breast and throughout the length of the keel. The keel should be approximately parallel with the back.



The shape of the body in live birds is very important in determining the appearance of dressed poultry. Center photo of dressed carcass shows keel parallel with back. (Photo by W. A. Maw, from "Poultry Husbandry" by M. A. Jull reprinted by permission of McGraw-Hill Book Co. Inc.)

# "LIFE IMMUNITY"

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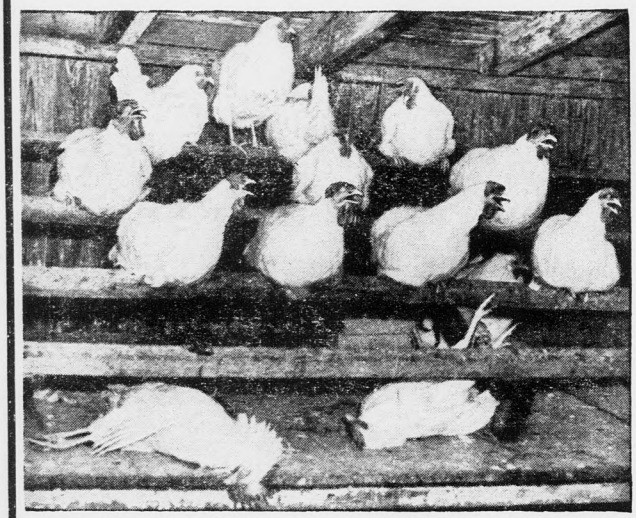

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VINELAND PIGEON POX VACCINE is recommended for the prevention of Fowl Pox in broilers, and in preventing the further spread of outbreaks of Fowl Pox in laying flocks. VINELAND PIGEON POX VACCINE is mild and does not interrupt egg production or growth.

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**VINELAND VACCINES**

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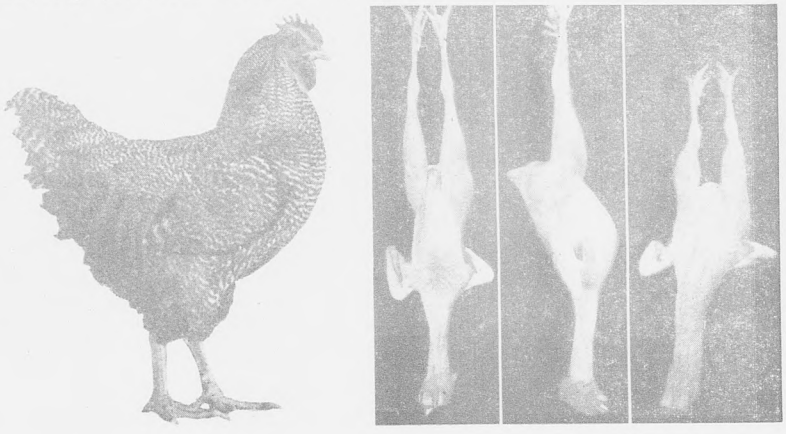

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| Fibre | 3% | Fibre | 0% |
| Vitamin G micrograms per gram | 8 | Vitamin G micrograms per gram | 6 |
| Solids | 30% | Solids | 28% |
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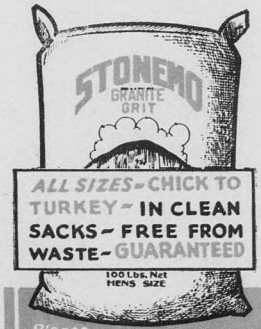


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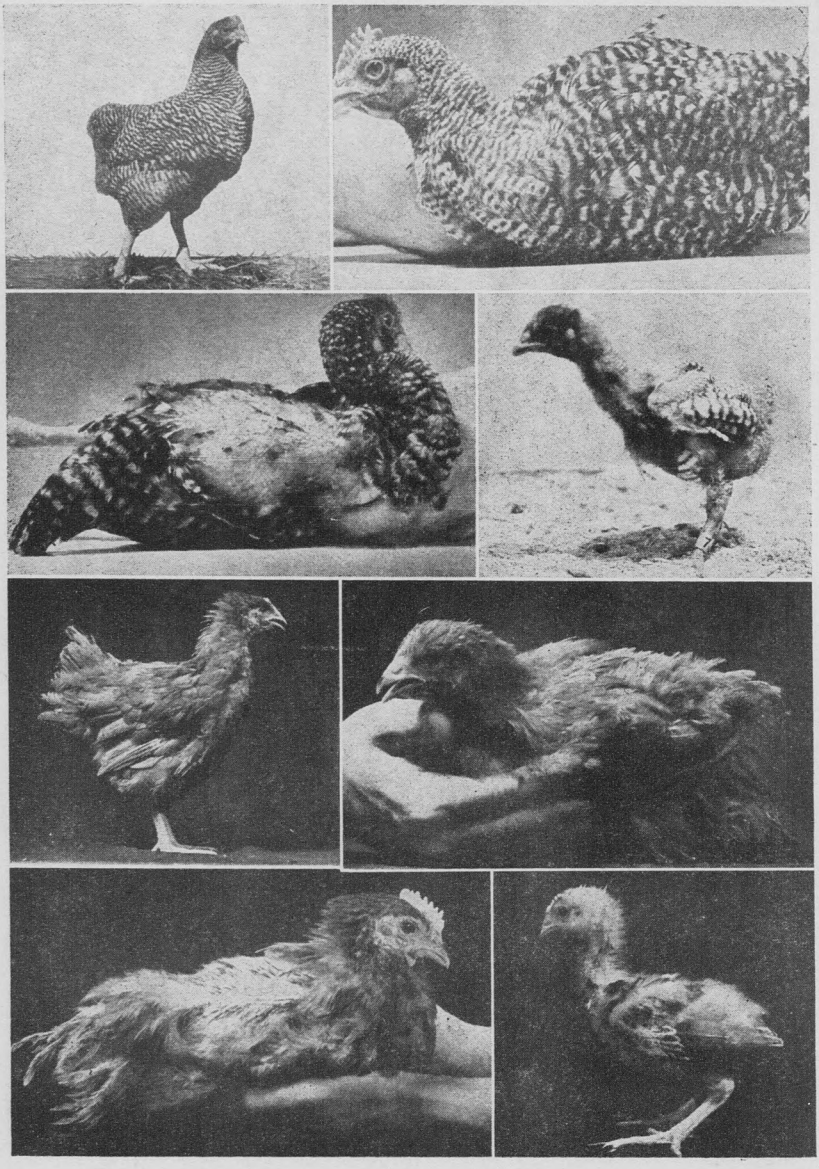
# RAPID FEATHERING VERY DESIRABLE FOR BROILERS AND FRYERS



The four birds standing show differences that sometimes exist between fast-feathering and very slow-feathering Barred Rocks and New Hampshires at about 6 weeks of age. The four other birds represent differences in feathering over the back at about 8 weeks of age. Breeding stock for the production of broilers and fryers should be selected for rapid wing feathering at hatching time and rapid tail feathering at 10 days of age.

## SECURE YOUR BABY CHICKS FROM PULLORUM-TESTED FLOCKS

Both from the standpoint of producing as many eggs and as much poultry meat as possible to help in the war effort, and common-sense economy on the part of the farmer, it is very important to secure chicks from flocks that have been officially tested for pullorum disease.

Broods of chicks infected with the organism that causes pullorum disease sometimes suffer as much as 50 per cent mortality. The disease is transmitted from the hen to her chicks through the medium of the eggs. That is why it is advisable for every flock that is used for breeding to be tested for the pullorum disease. The test is conducted under the supervision of the State Livestock Sanitary Service.

Every flock should contain less than 2 per cent reactors to the test. If the flock contains more than 2 per cent, it should be retested at intervals of not less than three weeks until the per cent of reactors is less than 2 per cent.

Most chicks are purchased from hatcheries, so that it is important for hatchery operators to carry on a pullorum-testing program with flocks from which they secure their hatching eggs. Most of the more important hatcheries in Maryland are carrying on official testing of their flocks. These hatcheries produce chicks that usually live better than chicks secured from hatcheries not carrying out any pullorum-testing program. The Poultry Department of the University will send anyone requesting it a list of hatcheries producing chicks from pullorum-tested flocks.

Hatchery operators whose flocks test below 2 per cent are rated as Maryland pullorum-controlled hatcheries. Those whose flocks have passed a complete negative test are rated as Maryland Pullorum-passed hatcheries. Those whose flocks have passed two annual negative tests are rated as Maryland pullorum-clean hatcheries.

## THYROACTIVE IODOCAESIN STIMULATES GROWTH

At the Missouri Experiment Station it was found that thyroactive idiocaesin with a potency of 3.1 per cent that of thyroxine, mixed with a basal mash at the level of 36 grams per 100 pounds of mash, produced slightly heavier chickens at 12 weeks than the controls. However, at levels higher than 113 grams of thyroactive idiocaesin with a potency of 2 per cent that of thyroxine growth was depressed and mortality increased.

## WHAT A DIFFERENCE!

A 5 pound 100-egg bird eats about 9½ pounds of feed per dozen eggs produced whereas a 5-pound 200-egg bird eats about 5½ pounds of feed per dozen eggs produced. If feed costs $60 per ton, the 200-egg bird produces eggs at 12 cents less per dozen than the 100-egg bird. This difference is worth a great deal to a 100-bird flock owner as well as a 1000-bird flock owner.

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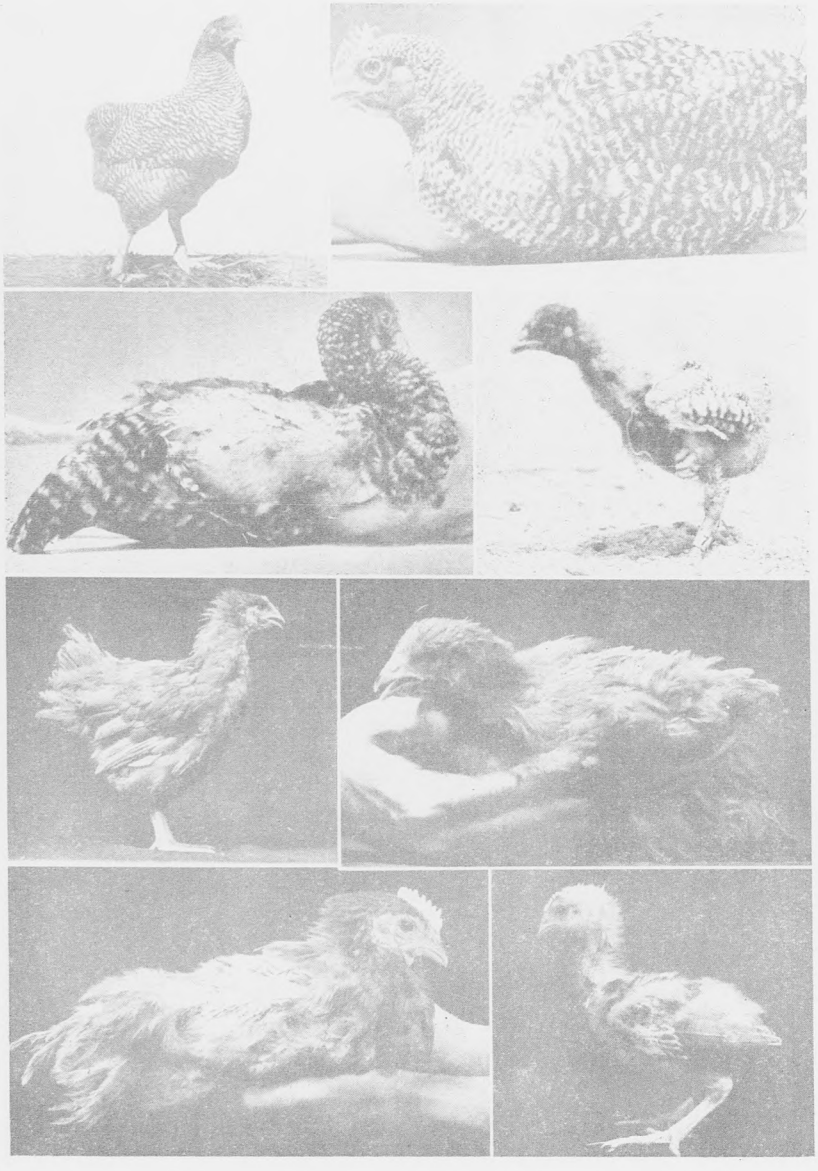

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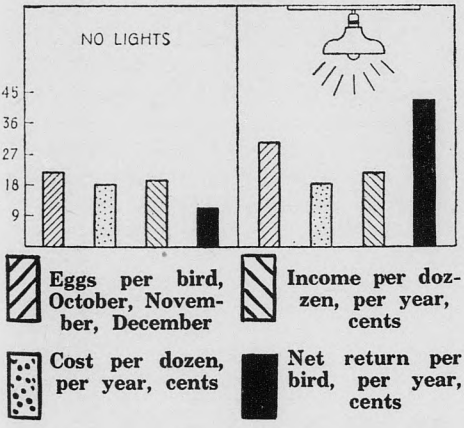
# ARTIFICIAL LIGHTING INCREASES PRODUCTION DURING FALL AND WINTER

By MORLEY A. JULL, University of Maryland

The artificial lighting of pullets increases fall and early winter egg production, when egg prices are higher than at other times of the year. When pullets are placed in the laying house in the late summer or early fall, they should be given a 14-hour working day by the use of artificial lighting, morning lighting to daylight being preferred to other systems of lighting. Have feed and water available for the birds when the lights are turned on automatically early in the morning. In cold climates the water can be kept from freezing during the winter months by the use of water heaters. Continue artificial lighting until about April 1. See the chart on this page for differences in results secured between unlighted and lighted flocks in Michigan, 1932-35.

After the pullets have been laying for several months, egg production is likely to drop, especially during July and August in the case of birds hatched the previous spring. Some hens start to molt and others also tend to lose in body weight and stop laying. Beginning about July 1, it is a good practice to cull the flock thoroughly. Market those that definitely have stopped laying for the year. Keep the others in good production by whatever means is possible because they lay larger sized eggs than the new crop of pullets just coming into production. It is much easier to keep the good hens laying than it is to get them started again once they have stopped. A 14-hour day of morning artificial lights and normal daylight, together with moist mash or pellets at noon, will help to keep up body weight and maintain a good level of egg production among these selected hens.




**Records on 276 Michigan flocks shaw that in October, November and December, the lighted flocks laid more eggs than layers not lighted; so that for the year the feed cost per dozen eggs was lower, the income per dozen was greater, and the net return per bird was greater.** (Data of K. T. Wright, Mich. Experiment Station, 1938. Cut by Poultry Tribune.)

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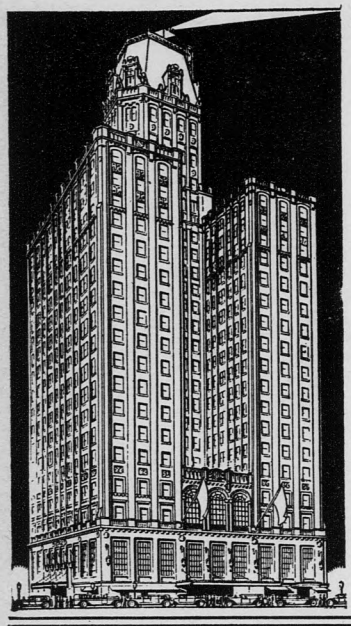

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## ADVANTAGES IN HAVING YOUR OWN TURKEY BREEDING FLOCK

There are several advantages in maintaining your own turkey breeding flock, among them:

1. You can be more certain of securing the quality of poults you need in order to have a profitable flock, if you are doing a good job of breeding.
2. You can carry on a selection and breeding program to improve the quality of the poults each year.
3. The cash cost of securing poults is reduced.
4. You have a better chance of securing the desired number of poults you need when you want them.
5. You should be able to sell some hatching eggs either before or after your own poults are hatched.

## SUBSTITUTES FOR DRIED SKIMMILK IN GROWING CHICK DIETS

At the Beltsville Research Center a series of different mixtures of alfalfa leaf meal, dried whey, B-Y feed, fish meal, meat scrap, and peanut meal were used as substitutes for dried skimmilk in a high-quality starting-and-growing diet and in a simple diet that consisted chiefly of ground oats and dried skimmilk. When these mixtures were substituted for dried skimmilk in the high-quality starting-and-growing diet, all of them were satisfactory. When substituted for dried skimmilk in the diet that consisted chiefly of ground oats and dried skimmilk, the mixtures containing fish meal and B-Y feed or dried whey were superior to those containing meat scrap, and superior even to dried skimmilk. The droppings of the eight pens of chicks that were fed the diets that contained a large quantity of dried skimmilk or of any of the substitutes were highly fluid; however, the health, rate of growth, and efficiency of feed utilization of these chicks were not affected.

## EFFICIENT DUCK PRODUCTION

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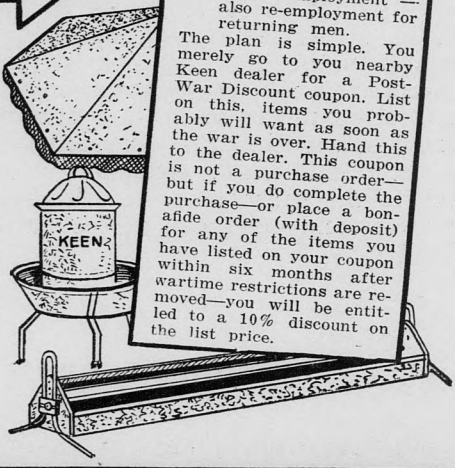
For you who must have replacement or additional equipment, priorities are permitting the manufacture of a limited amount of Keen equipment. Some "victory" model equipment may also be available.

**If We Can't Supply You Immediately Take Advantage of our Post-War Discount Plan**

Believing that many who by necessity and by good care will make present equipment carry through, will prefer to wait for replacements until top quality standards as exemplified by Keen can be again fully guaranteed—we offer our Post-War Discount Plan.




**SAVE 10%**
**BY OUR**
**Post-War Discount Plan**

1. Save Money.
2. Obtain delivery sooner (after the war).
3. Enable us to assure steady employment — also re-employment for returning men.

The plan is simple. You merely go to you nearby Keen dealer for a Post-War Discount coupon. List on this, items you probably will want as soon as the war is over. Hand this to the dealer. This coupon is not a purchase order—but if you do complete the purchase—or place a bonafide order (with deposit) for any of the items you have listed on your coupon within six months after wartime restrictions are removed—you will be entitled to a 10% discount on the list price.

**KEEN POULTRY EQUIPMENT CO. BOX 5C Vineland, N. J.**

# USING HOME-GROWN SOYBEANS AS POULTRY FEED

By H. R. BIRD, University of Maryland

Of all requests that have come to the Poultry Department during the past year for information on feeding, one of the most frequent has been for advice on the use of home-grown soybeans. Ground soybeans can be used in small quantities in poultry feeds, but there are two important obstacles to their use, both of which can be overcome. First, ground soybeans readily become rancid when mixed with other feed ingredients and thus contribute to deterioration of the feed. This means that feed should be fed within a week after mixing, which after all is good practice under any circumstances. Second, though soybeans are high in protein, containing about 36 per cent, their protein is of inferior quality unless they are cooked.

Cooking can be satisfactorily accomplished by boiling the beans for about one hour, but after such treatment the beans would probably have to be fed as a constituent of a wet mash, and this has disadvantages. Investigations at this Experiment Station showed that the feeding value of soybeans was greatly increased by passing the whole beans through a grain drier, without ventilation, at such a rate that they were exposed to an average temperature of 217 degrees F. for 42 minutes. Since drying of the beans during heating tends to decrease their feeding value, they were not exposed to a current of air as grain would be when passed through the drier. The experiments have not yet been carried far enough to establish the best method of treatment in the drier, but this temperature and time gave the best results thus far attained. Chicks were grown in confinement to an age of nine weeks on a mash containing 30 per cent of ground heated beans as the only protein supplement. Their growth was less rapid than one ordinarily wishes under practical conditions. Growth was much improved by adding 4 per cent of fish meal to the mash.

As it is now illegal to buy or sell unprocessed soybeans for feed, the above remarks will be helpful only to farmers who raise both chickens and soybeans. There must be many of these, if one may judge by the number of requests for information on this subject.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# TRENDS IN FACTORS AFFECTING THE COST OF PRODUCTION AND PROFITS OF POULTRY AND EGGS IN MARYLAND

By W. H. RICE, University of Maryland

The accompanying tables point out facts of interest and value to Maryland poultrymen relative to trends in production costs and selling prices which largely control profits in poultry and egg production.

Table 1 shows that egg prices have advanced 86.8% for October, 1943, over October, 1939, while poultry prices have advanced 69.8% and the price of laying mash advanced 55.3% in the same period.

The value of a dozen eggs in terms of the number of pounds of feed they would buy, has advanced from 11.3 lbs. for October 1939 to 13.6 lbs. for October, 1943, or 20.3%.

The value of a pound of poultry in terms of the number of pounds of feed it would buy has advanced from 7.3 lbs. in October, 1939, to 8.0 lbs. in October, 1943, or 9.6%.

In considering Table I it should be borne in mind that the efficiency of feeds since January 1, 1943, have been lowered through reduced protein levels and substitution of less efficient ingredients for some of the more efficient ones. This reduction in the efficiency of the available feeds results in more feed being required to produce a dozen eggs or a pound of poultry, thus necessitating more labor, longer use of equipment, and greater overhead costs than with feeds of normal efficiency. The estimated reduction of 6% in efficiency for egg production is probably low, since it probably does not fully account for the poorer quality of laying pullets raised in 1943.

It is probable that the reduced efficiency of available feeds at this time (November 1) has practically cancelled the advantages gained by producers in the factors shown in Table I.

Since feed constitutes the largest single item of cost in the production of eggs and poultry, it is evident that any adjustment which materially affects the efficiency of its utilization by poultry, will at the same time profoundly influence the poultry enterprise in practically all its aspects.

Table 2 which shows the increase in prices of the principal farm commodities of Maryland on the parity principle, shows that income from animal products has improved relatively less than other farm commodities. This data reflects the maladjustment of agricultural commodity price advances under the stress of the times, including problems of price control.

Tables 3 and 4 are of especial interest to commercial broiler producers. Table 3 shows that the cost of chicks and labor have advanced relatively much more than feed. The absence of price ceilings on chicks and labor probably accounts in part for prices of these items advancing relatively more than feed. Table 4 shows the distribution of costs of producing commercial broilers based on survey data in Maryland.

Table 5 shows the monthly farm wage rate with board paid in

Maryland as having advanced 89.1% for October, 1943, over October, 1938, while monthly wages without board advanced 77.2%. This reflects the difficulty farmers are experiencing in maintaining steady hired help.

The data presented in the tables indicates the need for increased attention by poultrymen to planning a more systematic use of both hired and family labor, as well as greater use of labor saving equipment in order to at least partially overcome the decreased efficiency of feeds and increased labor costs which seem certain to prevail for the duration.

**TABLE I—Average 1939 and 1943 monthly prices received by farmers for eggs and poultry, the average price paid for laying mash, and the feed, egg and feed, poultry ratios in Maryland*.**

| | Egg prices cents per doz. | | Poultry prices cents per lb. | | Laying Mash dollars per 100 lb. | | Feed-Egg ratio** | | Feed-Poultry ratio** | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1939 | 1943 | 1939 | 1943 | 1939 | 1943 | 1939 | 1943 | 1939 | 1943 |
| Jan. | 21.9 | 43.7 | 17.2 | 26.9 | 2.15 | 3.05 | 10.2 | 14.3 | 8.0 | 8.8 |
| Feb. | 18.6 | 34.7 | 17.1 | 27.9 | 2.15 | 3.15 | 8.6 | 11.0 | 8.0 | 8.8 |
| Mar. | 16.4 | 34.7 | 17.2 | 28.7 | 2.20 | 3.20 | 7.4 | 10.8 | 7.5 | 9.0 |
| April | 16.1 | 34.5 | 17.0 | 30.0 | 2.15 | 3.25 | 7.5 | 10.6 | 7.9 | 9.2 |
| May | 16.0 | 34.9 | 16.2 | 29.0 | 2.25 | 3.25 | 7.1 | 10.7 | 7.2 | 8.9 |
| June | 17.4 | 36.2 | 16.8 | 30.3 | 2.20 | 3.25 | 7.9 | 11.1 | 7.6 | 9.3 |
| July | 18.8 | 39.0 | 17.2 | 30.2 | 2.15 | 3.30 | 8.7 | 11.8 | 8.0 | 9.2 |
| August | 21.0 | 42.0 | 16.8 | 29.3 | 2.10 | 3.45 | 10.0 | 12.2 | 8.0 | 8.5 |
| September | 24.6 | 46.5 | 17.5 | 29.2 | 2.45 | 3.55 | 10.0 | 13.1 | 7.1 | 8.2 |
| October | 26.6 | 49.7 | 17.2 | 29.2 | 2.35 | 3.65 | 11.3 | 13.6 | 7.3 | 8.0 |
| November | 28.8 | | 16.1 | | 2.30 | | 12.5 | | 7.0 | |
| December | 24.6 | | 15.0 | | 2.35 | | 10.9 | | 6.4 | |

*Data of U. S. Crop Report Service

**Number of pounds of feed equal in value to one dozen eggs and one pound of poultry, respectively. Due to feed conservation measures, especially reduced protein levels and substitutions, the efficiency of feeds since January 1, 1943 has been reduced, thus requiring more feed to produce a dozen eggs or a pound of chicken than in previous years. The effect of these feed revisions is conservatively estimated at 6 percent less for egg production and 15.4 less for poultry production than the 1943 figures shown in the table.

**TABLE II—Index of Maryland Farm Prices (1910-14—100)***

| | Grains | Dairy Products | Truck Crops | Meat Animals | Fruit and Berries | Tobacco | Chickens & Eggs |
|---|---|---|---|---|---|---|---|
| 1939 October | 90 | 120 | 107 | 121 | 70 | 273 | 115 |
| 1940 October | 90 | 130 | 83 | 121 | 74 | 277 | 118 |
| 1941 October | 107 | 149 | 114 | 145 | 117 | 443 | 145 |
| 1943 October | 124 | 171 | 140 | 191 | 121 | 401 | 173 |
| 1943 October | 177 | 197 | 213 | 200 | 301 | 817 | 208 |
| Per Cent Increase, 10-1939 to 10-1943 | 96.6 | 64.1 | 99.5 | 65.3 | 330.0 | 199.3 | 80.9 |
| Increase in Index, 1910-14 to Oct. 1943 (Points) | 77 | 97 | 113 | 100 | 201 | 717 | 108 |

* Source: Maryland Crop and Livestock Reporting Service.

**TABLE III—Prices Paid by Broiler Producers***

(For the Month of July of Each Year)

| Year | Feed, per 100 lbs. Amount | Per Cent 1940-100 | Chicks, per 100 Chicks Amount | Per Cent 1940-100 | Labor, per day Amount | Per Cent 1940-100 |
|---|---|---|---|---|---|---|
| 1940 | $2.42 | 100 | $7.34 | 100 | $1.85 | 100 |
| 1941 | 2.56 | 106 | 8.76 | 119 | 2.09 | 113 |
| 1942 | 2.96 | 122 | 10.02 | 136 | 2.77 | 150 |
| 1943 | 3.52 | 145 | 15.45 | 210 | 3.84 | 208 |

(Continued on Page 47)

# This Matter of SUBSTITUTES

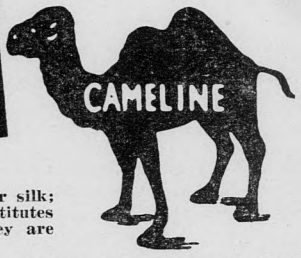


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**TABLE 4. Cost of Producing Broilers***

(As of July, 1943)

(Continued From Page 45

| Item | Pound Live Weight | Per Cent of Total |
|---|---|---|
| Feed *1 | 15.5 | 58.7 |
| Chicks *2 | 5.9 | 21.0 |
| Labor *3 | 1.2 | 4.3 |
| Depreciation and overhead | 2.0 | 7.1 |
| Coal | 1.0 | 3.6 |
| Miscellaneous *4 | 1.5 | 5.3 |
| TOTAL | 28.1 | 100.0 |

*1 Feed at 3.52 per 100 lbs., adjustment for 15 per cent decreased efficiency of feed.
*2 Chicks at average price of $15.45 per 100, adjustment for 10 per cent mortality.
*3 Labor at $3.85 per day — one man to care for 10,000 birds.
*4 Includes cost from mortality.
* Data from Department of Agricultural Economics, University of Maryland.

**TABLE 5. Farm Wages Rates Per Month, Maryland, 1928-1943***

| | WITH BOARD | | | | WITHOUT BOARD | | | |
|---|---|---|---|---|---|---|---|---|
| Year | January | April | July | October | January | April | July | October |
| 1928 | 34.00 | 36.00 | 36.00 | 36.00 | 49.75 | 52.75 | 52.50 | 51.25 |
| 1933 | 19.75 | 18.25 | 18.75 | 20.25 | 31.00 | 28.75 | 29.25 | 31.00 |
| 1938 | 26.25 | 27.00 | 27.00 | 27.00 | 38.25 | 39.25 | 39.25 | 38.50 |
| 1943 | 42.75 | 46.75 | 49.25 | 52.00 | 62.50 | 66.25 | 70.00 | 70.00 |

* Source: Bureau of Agricultural Economics, United States Department of Agriculture.

# BUY R. O. P. MALE CHICKS TO BOOST EGG PRODUCTION

Even in normal times, when it was possible for farmers to feed diets well balanced with animal protein supplements, many flock owners did not average much more than 100 eggs per bird. That's not enough to give the flock owner any returns for his labor because 150 eggs per bird is necessary to provide a reasonably good labor income.

Male chicks of superior quality make a good investment at almost any price, particularly during these emergency times, when there is such a demand for eggs. Securing high quality male chicks from outstanding breeders is one of the surest ways to increase the level of production in a flock in the years to come. Next spring get enough male chicks to allow for some culling and next winter mate them to your flock of females. The pullets secured from R.O.P. breeders should lay much better than your present flock average.

Relatively high egg production is of greater importance than ever and the longer the war lasts the more important good egg production will be, especially as long as animal protein supplements are difficult to obtain to balance the laying diet.

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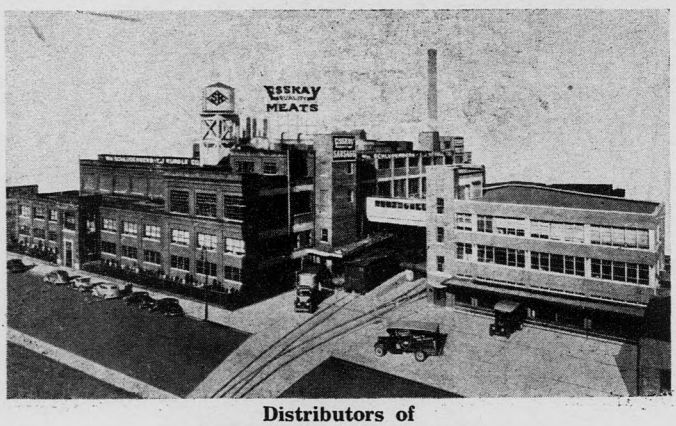


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# EGG-PROPAGATED VACCINES FOR THE ARMED FORCES

By R. E. PHILLIPS, University of Maryland

At the present time great quantities of vaccine are needed by our military personnel. By using eggs to propagate the organisms that make up the vaccines it has been possible to produce the material on a mass basis.

Under the present conditions of global warfare it is not uncommon for a part of our armed forces to be exposed to one or more of the rickettsial diseases. The most common of these diseases are typhus and Rocky Mountain spotted fever. Typhus is the most widespread and serious disease of this group. The members of our armed forces are vaccinated as a protective measure if they are to be sent to areas where danger of epidemic typhus fever exists.

Epidemic typhus fever if transmitted from one person to another by the human body louse. Endemic typhus fever, which is not uncommon in the United States at the present time, it spread by the fleas of the rat. Dog and wood ticks serve as vehicles for the transmission of Rocky Mountain spotted fever.

The organism which causes typhus fever will not grow or multiply except within a living cell. It was found that the typhus organism would grow and multiply in the yolk sac of the developing chick embryo. This discovery made it possible to produce the vaccine in sufficient quantities to immunize large groups of people.

The vaccine is prepared by injecting a small amount of the typhus organism into the yolk sac of the growing chick embryo. A continuation of the incubation process causes the organism culture to grow rapidly. When the embryo in the injected eggs are killed by the organism, the cultures are ready for harvest.

To obtain the potent culture from the incubated hen's egg, a portion of the shell is removed and the yolk sac, which contains the live organisms, is separated from the chick embryo. After the separation the yolk sacs are pooled and homogenized. After homogenization the suspension of typhus organisms is killed by chemical means and the solution is centrifuged and filtered. The potency of the vaccine is then determined by immunizing small laboratory animals against infective doses of the typhus organism. The use of eggs in the process of manufacturing vaccines for devastating diseases is just cause for the poultrymen to feel proud of his contribution to humanity.

# MAKING OLD ROOSTERS TENDER

Dr. F. W. Lorenz of the University of California has recently shown that the injection of a synthetic sex hormone into old roosters has a tenderizing effect on the flesh.

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## GREEN ACRE FARMS

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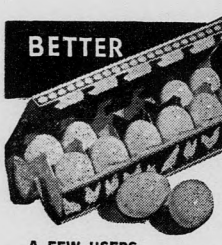


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# HOW DO YOUR CHICKS LIVE?

By CHARLES S. WILLIAMS, University of Maryland

This is a question that hatcherymen should be able to accurately answer. However, there are many hatcherymen that do not honestly know how their chicks live in the hands of their customers. This is very surprising since the livability of chicks is one of the best selling points the hatcheryman has.

Chick customers as a rule know how the chicks live that they purchase from a certain hatchery. If the chicks live well the hatcheryman hears about it in many cases but oftentimes he doesn't. On the other hand, if a chick customer experiences heavy mortality in a group of chicks the hatcheryman usually hears about it but oftentimes when he does it is too late for him to do anything about it and after he has lost a customer.

There is no reason why with proper management the chicks produced by hatcherymen should not live reasonably well. Other than management, pullorum disease is probably the main reason for chick losses up to three weeks of age. Data indicate that the lower the pullorum infection in a flock the better the livability of the chicks. There is no good reason why hatcherymen should not test and retest their hatchery supply flocks until the infection is low enough to insure good livability.

Many hatcherymen are afraid to use means to determine how their chicks live in the hands of their customers. Yet, the hatcherymen are the ones who should know how their chicks live because if they expect to remain in the hatchery business they must produce chicks that will live.

Many hatcherymen are supplying each purchaser of baby chicks with a record form on which he records the mortality up to twenty-one days or age. At the end of this period the form is returned to the hatchery and in this way the hatcheryman obtains an accurate record of the livability of his chicks. The accumulation of livability records over the chick season from many chick customers gives the hatcheryman reliable data on how his chicks live and at the same time indicate changes which he can make in his hatchery program to improve his chicks.

There is another very good reason for having the chick customer keep a mortality record. Most chick customers like to know that the hatcheryman is interested in them and how they get along with his chicks. This simple record is one way of gaining the confidence of chick customers and letting them know that you are interested in their problems and are striving to furnish them with a better chick at all times.

Any Maryland hatcheryman that is interested in obtaining chick livability record forms may secure them from the Poultry Department, University of Maryland.

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# RESEARCH POINTS THE WAY

**Results of Research of Maryland Agricultural Experiment Station Of Much Value To Poultry Industry**

Each year the Poultry Department of the Maryland Agricultural Experiment Station conducts numerous experiments on different problems of interest to the poultry industry. During the past year particular attention has been given to problems of practical importance, the results of which should enable poultrymen to increase their returns through more efficient production.

**Breeding For High Egg Candling Quality.**—A low but positive correlation between the candling quality of the eggs of a dam and those of her daughters was obtained, especially during the first several months of production. This correlation was determined on a monthly basis since there is some decline in candling quality from month to month during certain periods of the year. If a high correlation existed between the candling quality of the eggs of each dam and her daughter, it should be possible by selection and breeding methods to develop strains of egg producers that would consistently lay eggs of high interior quality. The results secured from this experiment indicated, however, that it would be very difficult to identify families of birds based on the candled appearance of the eggs. On the other hand, the results secured indicated quite clearly that hens differ in the candling quality of their eggs.

**Keeping Fresh-Laid Eggs Fresh in Quality.**—A specially built inexpensive type of egg cooler for cooling market eggs was operated under farm conditions. The temperature in the egg cellar in which the cooler was located ranged from 70 degrees to 78 degrees F., and the temperature in the egg cooler was maintained at approximately 57 degrees F. The time required to cool an individual egg from 100 degrees to 65 degrees was 30 minutes. The time required to cool 100 eggs in a bucket which had a wire screen bottom from 93 degrees to below 68 degrees F. was 40 minutes, and to cool the same bucket of eggs to 53 degrees was 90 minutes. Some difficulty was experienced in cleaning eggs after they had been stored in the cooler due to condensation of moisture on the shells when the eggs were removed from the cooler. The results of this experiment indicate that the use of this type of egg color would maintain high egg quality and reduce the number of trips to market.

**Specific Gravity of Chicken and Turkey Eggs and Hatchability.**—The relationship between the specific gravity of 3330 chicken eggs and 1559 turkey eggs and their hatchability was studied. Turkey eggs with a specific gravity of 1.070 or less and 1.095 or more failed to hatch when incubated at a wet bulb temperature of 86 degrees. The results secured from chicken and turkey eggs indicated that when breeding stock has been selected for high hatchability, there is no relationship between the hatchability of the eggs and their specific gravity. However, the results with chicken eggs indicate that when breeding stock has not been selected for high hatchability, specific gravity and potential hatchability are closely related.

**Hatchability Affected by Nutrition.**— Synthetic riboflavin added to a basal diet used in this study at a level of 4.5 milligrams per kilo-

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# Hunter, Walton & Co.

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gram of diet sufficed to maintain hatchability during a period of fifteen months at a level comparable with that of the positive control group which received 5 per cent of dried skimmilk. In a trial covering six months 1 milligram of synthetic riboflavin per kilogram of diet maintained hatchability comparable with that of the positive control group.

**Relation of Diet and Management to Hatchability.**—An all-mash ration of grains, mill by-products, good quality alfalfa meal, menhaden meal, soybean oil meal, vitamin A and D feeding oil, and mineral supplements can be made satisfactory for production of hatching eggs by the addition of just one vitamin-riboflavin. When low-riboflavin mashes were fed, an interesting difference in response between battery hens and hens kept in open-front houses was discovered. Hatchability of eggs from the former decreased to less than 20 per cent within a month and remained at a very low figure, while hatchability of eggs from the latter varied between 40 and 80 per cent during a period of 16 months. In an attempt to explain this difference, the feces of riboflavin deficient hens were fed to other deficient hens in batteries, and hatchability promptly increased to about 80 per cent. It has been shown previously that bacterial synthesis of ribloflavin occurs in chicken feces and it would appear that such synthesis may contribute to the riboflavin supply of chickens which have access to their feces.

**Inheritance of Rate of Browth and Feathering.**—Observations were made on purebred Barred Plymouth Rocks and Brown Leghorn stock and on crossbred progeny between these breeds. Body shape, determined by the ratio of mean shank length to the cube root of mean body weight of the progenies of the parental, first-hybrid generation, and backcross matings, was found to vary only slightly at 8 weeks of age. Neither the sex-linked gene B for barring, nor the sex-linked gene K for slow rate of feathering, had a significant influence on rate of growth. In all matings but one, the non-barred fast-feathering males and females grew at a more rapid rate than the barred fast-feathering barred slow-feathering, and non-barred slow-feathering males and females.

**Riboflavin Supplements in Diets Stimulate Growth.**—Dried whey, distillers solubles, a butyl fermentation residue, synthetic riboflavin, and a riboflavin concentrate mixture were each used as a source of riboflavin in diets for growing chickens. Each material was fed to different groups of chickens to supply 50, 150, and 250 micrograms of riboflavin per 100 grams of diet. All supplements were found to be satisfactory sources of riboflavin.

**Comparsion of Response of Turkey Poults and of Growing Chickens to Different Sources of Vitamin D.**—Turkey poults and growing chickens respond quite differently to different vitamin D potent materials. The number of "poult units" per gram was found to be 218, 934 and 935 for cod liver oil, irradiated 71dehydro-cholesterol, and "irradiated animal provitamin", respectively. The results secured indicate that vitamin D potencies established by chick assays are probably applicable to turkey feeding practice in the case of unfortified cod liver oils, but the other two materials have greater potency for turkey poults than would be indicated by a chick assay.

**The Place of Soybean Meal in Poultry Diets.**—The serious shortage of animal protein feedstuffs, including milk products, meat scraps,

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and fish meal, has resulted in the extensive use of soybean meal as a source of protein in diets for growing chickens and laying hens. An investigation was conducted by Dr. H. R. Bird to determine the ability of various materials to supplement a starting and growing mash containing soybean oil meal as the only protein supplement. Experiments were also conducted on a laying mash containing soybean oil meal and corn gluten meal as the only protein supplements.

Broilers were grown satisfactorily on mashes containing the following combinations of protein supplements: 25% soybean oil meal and 4% fish meal, 25% soybean oil meal and 4% dried skimmilk, 15% soybean oil meal and 15% corn gluten meal. Combinations of soybean oil meal with meat scrap were not satisfactory except in the case of a special meat scrap containing a large proportion of intestinal linings. Other materials which did not effectively supplement high soybean meal diets were: blood meal, dried fish viscera, powdered swine hoof, soybean lecithin, NaCl, and KI. A laying mash containing soybean oil meal and corn gluten meal as the only protein supplements supported excellent egg production and maintained body weight throughout the course of a 7 months' experiment. The results secured indicate more effective utilization of soybean oil meal, now the most important protein supplement in poultry feeds from a quantitative standpoint.

**Variability of the Feeding Value of Soybean Oil Meal.**—Soybean oil meals processed by the expeller method were found to be superior than meals processed by other methods, but variability of expeller meals was as great as among solvent meals. The menhaden meal supplement reduces variability, and with nearly all soybean meals, results in satisfactory growth. On the basis of heating experiments it appears unlikely that differences in processing temperature or time of heating are major causes of variability. Whole soybeans, properly heated in a grain dryer, supported good, but not optimum, growth.

Average weights of groups of 9-week-old chickens ranged from 613 to 871 grams when groups were fed different lots of soybean oil meal as sole protein supplement. When 4% fish meal was fed, the range was 673 to 930 grams. It was not possible to produce soybean oil meal comparable to the best meals in the above series by regulation of time of heating at 104 degrees or 128 degrees C. Maximum feeding value was achieved by heating 2½ minutes at 128 degrees C. Longer heating at 128 degrees caused impairment. Considerable improvement in the feeding value of whole soybeans was achieved by heating in a grain dryer at 103 degrees C. for 42 minutes.

**Sex Hormones Stimulate Ovarian Activity.**—Two sex hormones were implanted or injected into birds in order to determine their effects on age at sexual maturity and on the formation of eggs. The sex hormones when implanted into pullets six weeks old were found to delay the onset of sexual maturity. The gonadotropic hormones caused marked ovarian stimulation but egg production stopped due to ovarian injury.

**Shrinkage in Dressed Poultry and Proportion of Parts of Drawn Poultry.**— Fresh dressed weight is approximately 90 per cent of live weight; chilled dressed weight is approximately 88 per cent of live weight; eviscerated weight is about 68 to 70 per cent of live weight.

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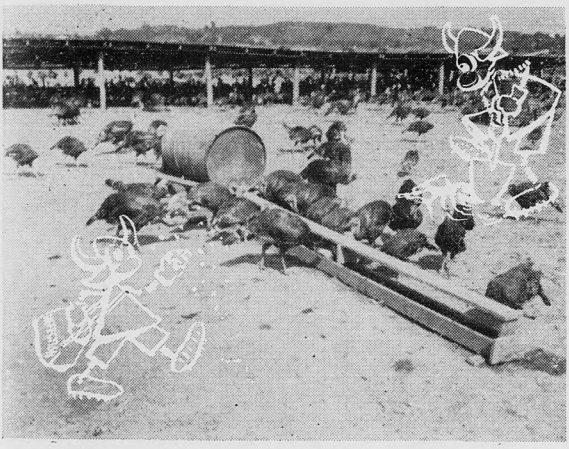
Since most poultry diseases are filth-borne, the obvious thing for poultrymen to do is to keep their poultry premises and all feeding and watering utensils clean and sanitary.



The top view shows a gremlin very busy distributing disease germs from sick to healthy turkeys. They do the same with chickens, especially in the case of coccidiosis, respiratory and other diseases.

The bottom view shows two gremlins spreading the eggs of internal parasites around feed hoppers and water containers.

(Cuts courtesy Turkey World by M. C. Small)

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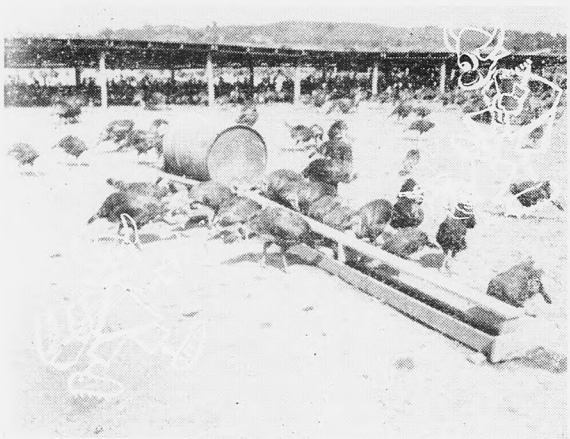

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# EFFICIENCY FACTORS AND LABOR INCOME IN EGG PRODUCTION

By MORLEY A. JULL, University of Maryland

Labor income is the pay a poultryman receives for his labor and management, after deducting all expenses and interest on capital invested in the enterprise. In other words, labor income represents the amount of money which the poultryman receives from his egg-production enterprise.

Among the various factors affecting returns in egg production, the following three are of major importance: (1) yearly egg production per bird; (2) fall egg production per bird; (3) laying flock mortality. Labor income per bird in relation to these three factors and the feed cost per dozen eggs produced is given in the following table for White Leghorn flocks in Ohio, 1933-1938.

| Efficiency factor | Average labor income per bird | | | |
|---|---|---|---|---|
| | Under $.54 | $0.74 | $1.54 | $2.72 |
| Yearly egg production per bird | 128.5 | 144.5 | 164.5 | 184.7 |
| Oct. to Jan. egg production per bird | 34.8 | 37.8 | 45.5 | 55.4 |
| Laying-flock mortality, per cent | 26.1 | 24.4 | 18.9 | 14.4 |
| Feed cost per dozen eggs, cents | 15.0 | 12.6 | 11.9 | 11.8 |

Three other efficiency factors of major importance in determining labor income in market egg production are: (4) overhead costs, expressed in terms of cash sales per dollar invested; (5) size of the enterprise; (6) labor efficiency.

The larger the number of efficiency factors in which laying flocks excel, the greater the labor income obtained from the flock. This is very clearly illustrated in the next table for 128 commercial flocks in Connecticut in 1938 and 276 farm flocks in Michigan from 1932 through 1935.

| Number of efficiency factors in which flocks excelled | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| Connecticut commercial flocks | $233 | $485 | $765 | $1,444 | $2,019 | $2,927 | $3,531 |
| Michigan farm flocks | — | -$44 | $42 | $80 | $145 | $211 | — |

The six efficiency factors mentioned are all under the control of the flockowner. The kind of stock kept, the diets fed, and the management of the flock—determine largely the yearly egg production per bird, the fall egg production, and the amount of mortality. These factors determine largely the value of cash sales made depending upon the price received for eggs and poultry of various kinds.

The flockowner has very little control over the price he receives for his products, but he should be as diligent as possible in making sure that he receives the best prices obtainable by producing products of superior quality and by taking advantage of the best market outlets.

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# TURKEY MANAGEMENT PROBLEMS

By V. S. ASMUNDSON, University of California

The quality of the stock is important—particularly rapid growing birds, good conformation, early maturity.

Since the breast conformation is the most important in considering market quality of turkeys, it would seem best to emphasize that and to pay some attention to length of keel, but to pay relatively little attention to length of leg. Excessive shortness of the leg may actually be detrimental to fertility.

For the purpose of selecting breeding stock it may be assumed that differences in readiness for market are inherited. Management and feeding are also very important in determining when birds are ready for market. The currently popular broad-breasted type can be marketed much earlier than the older, less well-fleshed type because the carcass will have an attractive appearance even if not so fat as required to bring it into the top grade.

Present preference is for a large bird. Most of the strains of broad-breasted or other improved strains are large. Large birds which average around 18 pounds when ready for market require approximately a half pound less feed to produce a pound of turkey than do small birds which average around 13 pounds. Since one man will not be able to look after any more of the small birds than the larger birds, the labor cost of raising the small type is greater. The poults cost about the same; hence, the small birds cost more per pound when marketed. Before the smaller strains become popular, it will be necessary to obtain a premium for them to offset higher cost of production.

The one advantage of the small bird seems to be higher fertility, giving higher hatchability. This suggests that breeders should emphasize fertility in producing a larger bird. Over-emphasis on the short-legged type, use of unbalanced birds, is partly responsible for the complaints about poor fertility from the large broad-breasted bird.

The first essential of good management is to have only the number of birds that can be taken care of with the equipment and labor that is available. Give the birds lots of room. Where space is restricted, it is particularly important to use it adequately by spreading the feeders and waterers out so that the birds can get at them. Shade is very important during hot weather—feeders and waterers should be shaded.

Closely confined birds frequently pick feathers. Occasionally more severe forms of cannibalism develop. Spreading out the feeders and waterers will help to minimize this difficulty. If feather picking does develop then the birds will either have to be given more room or some mechanical aids will have to be used. Most of those used for turkeys are on the principle of the pig ring inserted in the lower beak, prevents closing mouth completely. Another method would be to remove one-third to not more than one-half of the upper beak at the time the birds are taken out of the brooders.

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# HIGH LAYING FLOCK MORTALITY VERY COSTLY

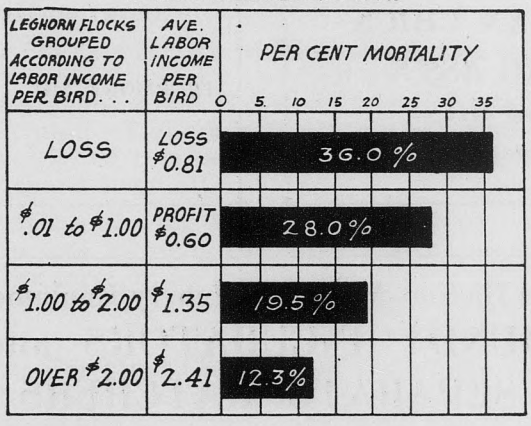
By MORLEY A. JULL, University of Maryland

High mortality in the laying flock is not always an indication of inefficient management because sometimes, in spite of the best care and attention given a flock, losses from mortality may be excessive due to some disease epidemic. Some epidemics occur through no fault of the flockowner. By and large, however, well managed flocks usually suffer less mortality than poorly managed flocks.

The effect that laying flock mortality may have on the loss or profit per bird per year is shown in data obtained from Ohio farm flocks. When the laying-flock mortality did not exceed 12.3 percent, the average profit for the laying year was $2.41 per bird. Flocks in which mortality averaged 19.5 percent made an average profit of $1.35 per bird. Flocks in which the mortality was 36 percent showed a loss of 81 cents per bird. The difference in returns between the first and last groups of flocks was $3.22 per bird.

All flockowners always should realize that losses from mortality are both a direct and indirect nature. Direct losses include the value of birds that die and the value of the feed and labor involved in rearing them up to the time of death. Indirect losses result from lowered egg production among many of the birds that survive the attacks of parasites and disease. Efficient management in controlling losses from disease and other causes is one of the best paying practices for all flock owners. High mortality in the laying flock is very expensive, the more so when feed prices are high and other costs of production are high.

The RELATION OF MORTALITY to LABOR INCOME PER BIRD



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**Rearing Turkeys in Confinement.**—The Michigan Agricultural Experiment Station has demonstrated that it is possible to raise turkeys in confinement. The amount of grain consumed was increased when corn and oats were fed free choice in contrast with corn alone with mashes containing 22.1, 28.6, and 32.2 per cent protein, respectively. Whole oats proved a desirable feed but corn was consumed heavily as maximum growth was attained and there was greater fattening.

**Phosphorus in Amorphous Calcium Metaphosphate** is utilized by growing chickens, as demonstrated by experiments conducted at the Maryland Agricultural Experiment Station.

**Crab Meal of Limited Value in Poultry Rations.**—The Massachusetts Agricultural Experiment Station demonstrated that in commercially prepared crab meal made by steam drying cannery waste of the blue crab, the gross value of its protein was only 59.

**Succulent Pasture Saves Mash.**—The Michigan Agricultural Experiment Station has demonstrated that when growing chickens have access to a good grass range, scratch grain may be fed in hoppers so that it is available at all times and from 10 to 20 per cent less mash is necessary. This is important because the mash is the more expensive part of the diet. It was also shown that droppings boards placed under each range shelter and moving the shelters every week will prevent the destruction of grass on any spot.

**Shark Liver Oil as a Source of Vitamins A and D.**—Poultry grade of shark liver oil was found by the Florida Agricultural Experiment Station to contain about 9,000 U.S.P. XI units of vitamin A per gram and 35 A.O.A.C. units of vitamin D per gram. Diets low in vitamin A because of scarcity of corn and alfalfa meal could be reinforced by the addition of shark liver oil.

**Additional Sulfur During Molt Produced Negative Results.**—During the molt hens lose sulfur in the form of feathers but feeding additional sulfur in the form of d-1 methionine did not shorten the molt nor was there any effect on rate of egg production following the molt, according to the New Jersey Agricultural Experiment Station.

**Sulfathiazole For Fowl Cholera?**—Preliminary work with a sulfa drug called sulfathiazole indicates that it may be of some value in the treatment of fowl cholera. The dosage is ¼ per cent of the total ration, but since treated birds that recover may still be carriers of the disease they should under no circumstances be allowed in contact with other birds and even then the disease may recur unless a very thorough disinfection and sanitation program is adopted following the treatment.

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So we say to you—our regular customers—help your Beacon dealer and protect your own position by determining your needs in advance. Plan with him how best to take care of them. Very likely your Beacon dealer is in a position to supply you with the same amount of feed you used during the corresponding period last year. If your need for feed is greater, it is doubtful if he can take care of the increase. We state this frankly, so that you can be fully aware of the situation and provide accordingly.

No one can foresee what the feed situation will be even a month hence. But there is one thing you can depend on—that Beacon will continue to produce the best feeds that can possibly be turned out with the raw materials available.

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